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Jack P. Manno

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*idea for intro: use quotes (e.g. D.W. Wilson
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think there are only 2 sides to land/use
(e.g.) using → i.e., indig. vs. Western.
Describe those, then add other views /
variations (as disc. in class). Then
intro. issues of SLT/feedback. Then bring
other element of "study".*

cust. ecol.

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PRIVILEGED GOODS

Commoditization
and Its Impact on
Environment and Society

by

Jack P. Manno

Executive Director
Great Lakes Research Consortium
State University of New York
Syracuse, New York

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Ecology and commoditization

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7.1 Sustainable development and the challenge of ecology

We certainly know enough now about ecology, and we are clever enough about the workings of the world to know the sorts of changes we need to make in order to create a more ecologically sound and sustainable way of life. We have known for some time that humans, like all life forms, extract resources from our environment and return wastes. If we take faster than the Earth can give and/or leave more than the earth can process, the balance of nature teeters and our lives become more difficult and less stable.

For development to be ecologically sustainable, knowledge gained from careful study of the impact of human activities on the health and functioning of ecosystems must be fed back into the development process and used to adjust

those activities. The capacity to learn and adapt is the starting point for sustainable development. Sustainable development requires a change in the relationship between human beings and the biosphere, a change from a relationship of parasitism to one of symbiosis. In a parasitic relationship, one party prospers at the expense of the other; in a symbiotic relationship, each enhances the other's capacity to thrive. To consciously design our communities, industries, and ways of life so as to benefit the natural world should be the highest goal of sustainable development. Short of that, we can at least try to do less harm.

Ecology might be the most politically challenging of the sciences, because its discoveries suggest that contemporary modes of human living cannot survive long into the future. Ecology also gives us the basic tools with which to consciously redesign our ways of life to disrupt the earth's natural cycles far less than we do today. However, the lessons from ecology fly in the face of the institutions and practices that maintain an economic system driven by commoditization. While commoditization virtually demands that more and more of the Earth's resources be wrenched from their tangle of coevolved ecological relations, ecology shows how this may lead to long-term losses in ecosystem productivity and eventually in ecosystem collapse. We may never fully grasp how utterly dependent we are on healthy ecosystems until they start to unravel. This lesson has not been lost on people in the Sahel and other places where the basic structures and functions of ecosystems have been destroyed. The problem of commoditization must be addressed or all the well-intentioned efforts to make modern economies more sustainable and environmentally benign will inevitably fail.

7.2 Ecological principles and economic implications

As long as we rely on market-based decisions to determine how we allocate the vast majority of our time, attention, and resources, then the commoditization forces I have described will accelerate and will overwhelm efforts to build a sustainable world. In the end, our environmental fate will be determined by how successful we are in developing policies that provide counterbalancing pressures to commoditization. Decommoditization by definition leads to less economic growth, even economic contraction. Richard Douthwaite, Herman Daly, and others have convincingly argued that we need to move beyond growth to a steady state economy.¹

The principles most relevant to an ecological understanding of economics are also those upon which a "sustainable" economy could be built. The remainder of this chapter will present each of these principles in general terms, the implications for environment and society, and how commoditization distorts economic behavior so as to place modern human societies out of sync with these principles:

1. Economic systems are subsets of ecological systems: The principle of ecosystem primacy.
Implication: Ecological considerations should trump economic ones.

2. Energy is the primary natural resource: The principles of entropy and conservation.
Implication: That is best which wastes energy least.
3. Efficiency is enhanced by working with natural flows and processes rather than against them: The principles of appropriate technology and ecosystem thinking.
Implication: Technology should be designed to work with rather than against natural flows of energy and materials.
4. Contradictory goals cannot be maximized at the same time and must be balanced: The principles of homeostasis and optimality.
Implication: Information indicating that the human economy is out of balance with nature must be received and processed and adjustments made to optimize the sometimes conflicting goals of prosperity and ecological integrity.
5. Scale and level of organization matter: The principle of cooperative hierarchical organization.
Implication: Economic policy decisions should simultaneously consider effects at the level of the individual, the level of the economic system, and the level of the global ecological system.

These principles can be considered allocation principles, determining where we should allocate human attention to live more compatibly and lightly on the earth. The pressures of commoditization make it difficult if not impossible to live by these principles. Because of commoditization economic goals almost always trump ecological ones. It is the price of fuel, not the logic of entropy, that determines how readily energy will be wasted. Working with natural flows requires long, careful observation and site-based ingenuity, neither of which can be mass-marketed. Balancing goals means ending the primacy of economics, and in effect ending the power of commoditization to allocate human attention. And taking system-level considerations into account when making economic decisions means giving processes equal value as products, and this, as we have seen, is contradictory to the imperatives of commoditization. The following sections go into more detail about each of the principles and their implications as well as the barriers commoditization places in the way of achieving an economy based on these principles. This will lead to Chapter 8, which will propose policies for countering the excessive power of commoditization in order to build an economy consistent with ecological principles.

7.2.1 Economic systems are subsets of ecological systems: the principle of ecosystem primacy

Implication: Ecological considerations should trump economic ones.

People and societies are not exempt from the laws of nature. And yet we think and behave as if these laws have no ultimate meaning to us. The sheer abundance of our species is evidence that we have managed to postpone

reckoning with the rules of ecological carrying capacity. An ecosystem's capacity to support, or carry, a given population of animal or plant is limited by available resources and the complex dynamics of ecosystem balance. Human intelligence and creativity have made it possible to utilize a far wider range of resources, and to obtain resources from above and beneath the land and oceans. Through our tremendous advances in transportation we have learned how to draw materials and energy from hinterlands far distant from our concentrated settlements, our cities. Our ingenuity makes it possible to find new sources of raw materials, to make synthetic substitutes when nature grows stingy, to continually get more out of lower quality raw materials and energy as the higher quality sources are depleted.²

Humans not only place demands on the environment through our place at the top of the food chain, but also have created an immense economic organism with its own highly organized process of appropriating materials (or nutrients) and secreting wastes, in effect an economic metabolism. When we begin to think of the human economy as an organism whose metabolism places demands on its environment we can no longer avoid the implications of ecological limits. Probably one of the most compelling shifts of perspective was when Herman Daly placed the familiar box diagram and model of the economy inside a larger box representing the Natural World (Figure 7.1). According to Daly, the old model illustrated a belief "that the economy is an isolated system in which exchange value circulates between firms and households. Nothing enters from the environment, nothing exits to the environment.... For all practical purposes, an isolated system [that] has no environment."³

When you look at Daly's illustration, three things stand out as obvious. First, the Natural World is the source of all materials for the economy (Daly and other ecological economists like to call this **Natural Capital**). Second, all the waste products of the economy are returned to Nature (in degraded condition). Third, the economy can only grow so large before it begins to fill all the available natural space. William Rees summarizes it neatly: "The material economy is an integrated, completely contained and wholly dependent growing subsystem of a non-growing ecosphere."⁴

Rees of the University of British Columbia and Mathis Wackernagel at Universidad Anahuac de Xalapa in Mexico have created a tool, ecological footprint analyses, that takes the notion of carrying capacity and makes it meaningful to the human economy in a compelling way. As we noted previously, industrialized and urbanized societies have so far been able to postpone a reckoning with the implications of limits to carrying capacity by being able to import resources and export wastes from distances far removed from their immediate settlements. This has been facilitated by tremendous advances in packaging and transport associated with commoditization. Rees and Wackernagel's ecological footprint analysis measures for any given population the area of land and water required to service that population's economic metabolism, i.e., produce the resources consumed and assimilate the waste produced by that population. Different analysts have used a somewhat different

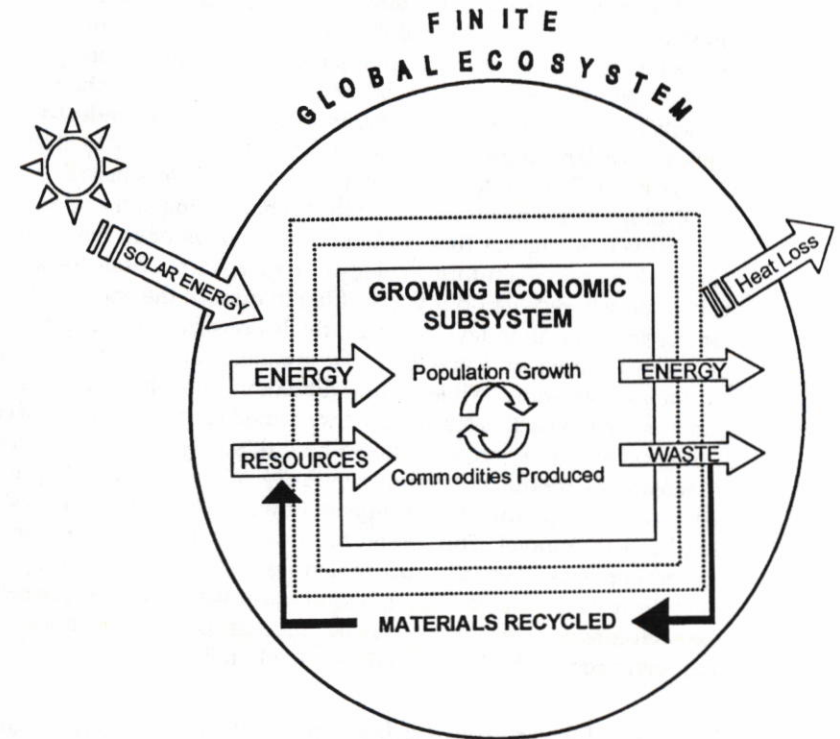


Figure 7.1 Commoditization accelerates the growth of the economic subsystem. It selects those goods and services with high embodied material and energy throughput (both energy and material input and waste energy and pollution output). (Adapted from Daly, H., *Steady State Economics*, W. H. Freeman, San Francisco, 1977.)

approach to adding up the size of the footprint depending on what variables are considered, but all show that a typical wealthy urban area in the industrialized North impacts and degrades a far greater area of forest, agricultural land, ocean, lake and wetland than the area of land they actually occupy, around 300 to over 1,000 times greater.⁵ The International Institute for Environment and Development, for example, studied the ecological footprint of the city of London and demonstrated that the amount of the Earth's surface required to maintain the city's economic metabolism was equivalent to the entire area of all of England.⁶

Rees estimates that "with prevailing technologies and average consumption levels, the present world population exceeds global carrying capacity by up to one third."⁷ Since the wealthiest 20% of the world's population presently consumes 80% of the world's resources, it is difficult to avoid the conclusion that the wealthiest of the Earth's people have

human ingenuity / creative / abundant use of natural / synth resources

Daly's model / illus.

ecological footprint analysis

global human popula

global & human pop. already appropriated more than the available carrying capacity of the planet, leaving virtually nothing to the remaining vast majority of the Earth's population. Others have calculated that from 40 to 50% of all the biological productivity is presently transformed or degraded by human activity. This figure shocked the world of environmental science when it was first published in *BioScience* in 1986.⁸ More recently, Peter Vitousek and colleagues have summarized global signals that the impacts of human activities have begun to significantly alter several of the Earth's key ecological indicators,⁹ including the following:

- 20% increase in atmospheric CO₂ concentration related to human activities
- 50% of all the accessible fresh surface water is being used
- Humans are responsible for over 50% of all terrestrial nitrogen fixation
- 20% of all current plant species in Canada are invaders from elsewhere, with similar percentages likely in other parts of the world
- 20% of all bird species on Earth are now extinct, mostly as a consequence of human activities
- 60% of major marine fisheries are considered fully exploited, over-exploited or depleted

Herman Daly described the difference between what he called empty world economics and full world economics. This distinction and its social and political implications lie at the core of the challenge that ecological economics presents to mainstream economists. In a full or nearly full world, as ours apparently is, the dangers of continuing on a path of unfettered economic growth are enormous. As we approach these environmental limits to economic growth the associated costs increase. These environmental costs are largely ignored by our conventional economic accounts such as GNP. Given this, Daly suggests we may be entering, or have already entered, a period of "antieconomic growth" in which the actual costs of growth outweigh the benefits.

The only way to reduce or stabilize economic growth while maintaining a high quality of life is to increase the amount of service provided per unit of economic output. But the means to accomplish this through real conservation and increased community self-reliance, as we have seen, rely heavily on goods in the economy of care and connection, which have intrinsically low commodity potential. Furthermore, as long as market forces determine economic behavior, only that which can be priced, bought and sold matters. Free goods and common goods, no matter how important, are considered extraneous to the economy. In the logic of commoditization, the natural world is merely a storehouse of raw materials for the production of commodities. What's left out is everything that resists commoditization which are, as we have seen, processes rather than products. These include ecosystem processes which produce and clean the air and water and build the soil, the planetary metabolism which maintains climate and ocean stability, the

biogeochemical cycles of the critical minerals and nutrients of the planet, and the processes of evolutionary change and genetic diversity. No matter that nothing is producible without it, nowhere will the economy value it as long as commoditization underlies the logic and practice of valuation. The model of an economy of firms and households abstracted from their environment is an illusion that confuses much more than it informs.

The problem is not with the discipline of economics nor with economists per se. They are doing their job as it is defined for them. The questions economists ask are subject to the same selection pressure of commoditization as everything else. The questions that survive and that matter in a commoditized economy are those whose answers inform the needs of managing or functioning within that economy. The tools of the economist are put to the service of the commoditized economy — that's who pays the bill. The tools economists have invented answer the questions about the flow and exchange of commodities. Only by political means can we assert values other than market values and so make it meaningful and rewarding to ask different questions of economists, including ecological economists.

In the logic of the argument of this book, ecosystem services are inherently services with low commodity potential: they are relational, local, and complex — the exact opposite of goods with high commodity potential, which are independent, universal, and simple. The economics of forestry can be reduced to the culturing, harvesting, processing, allocating, distributing, and storing of forest products. The complex dynamics of forest ecosystems and their roles in producing clean air and water and providing habitat for diverse forest life will only be protected and valued when such value is recognized as specifically noneconomic in a commoditized economy and is dealt with politically as a question of the common good.

Ecosystem services must be recognized as public goods that are to be protected by institutions with the capacity to protect the commons. This requires that governance evolve so as to gain the capacity to regulate the economy for specific environmental ends. This will be the fundamental principle in the design of policies to counter the effects of commoditization discussed in more detail in Chapter 8.

7.2.2 Energy is the primary natural resource: the principles of entropy and conservation

Implication: That is best which wastes energy least.

There are many excellent treatments of the implications of the first and second laws of thermodynamics for ecological economics. Daly offers the following useful summary. The first law suggests that energy cannot be created or destroyed, but only changed in form. The second law, also called the entropy law, suggests that the ability of energy to do useful economic work only decreases. Taken together, we only have so much useful energy available to us, and its ability to do work is in constant decline. Therefore, it is the availability of useful (low-entropy) energy that marks the

fundamental limit of economic production. We currently have two very different sources of low entropy energy available to us. A solar source with an unlimited stock, but constricted flow, and a terrestrial source (fossil fuels) with a limited stock, but unconstricted flow. According to Daly, after relying on the solar source for much of human history, we have recently become addicted to the terrestrial source, and the economic growth it provides. We have switched our dependence from the unlimited to the limited source of low-entropy energy. Inevitably, we will be forced to again live within the constraint imposed by the daily flow of solar energy bathing our planet. The sooner we begin to make this transition, the smoother it will go, but it will be difficult because it flies in the face of commoditization.

There are many other excellent treatments of the second law of thermodynamics and the implications of entropy for ecological economics.¹⁰ Paul and Anne Ehrlich and John Holdren summarize the meaning and implications of the second law in this way:

- In any transformation of energy, some energy is degraded.
- No process is possible whose sole result is the conversion of a given quantity of heat (thermal energy) into an equal amount of useful work.
- No process is possible whose sole result is the flow of heat from a colder body to a hotter one.
- The availability of a given quantity of energy can only be used once; that is, the property of convertibility into useful work cannot be "recycled."
- In spontaneous processes, concentrations (of anything) tend to disperse, structure tends to disappear, order becomes disorder.¹¹

Suffice it to say that the production of goods and services through the transformation of raw materials into useful products requires more energy than can be embodied in the goods and services, or reused or recycled from them. The economy of goods and services necessarily degrades the resources that it draws upon. The production of goods is always accompanied by the production of "bads." The energy that drives the economy goes in one direction only: usable resources become more scarce and waste more abundant. Most environmental problems are traceable to this fact.

Energy is only useful to us economically if it can be channeled to do work, in other words be applied to matter in such a way as to cause physical or chemical change (or to maintain structure in the face of entropic change). It takes work to hold things together. Structure, whether it is a human body or a chair, requires the application of work. Work must be powered by energy. Constrained by the second law of thermodynamics, energy can never be totally transformed into work; some must always be dissipated as the lowest quality energy, heat. There is, however, considerable gains that can be made in improving the efficiency in which energy is used to produce goods and services, especially in the U.S. Figure 7.2 shows the slight downward trend in the amount of energy used per U.S.

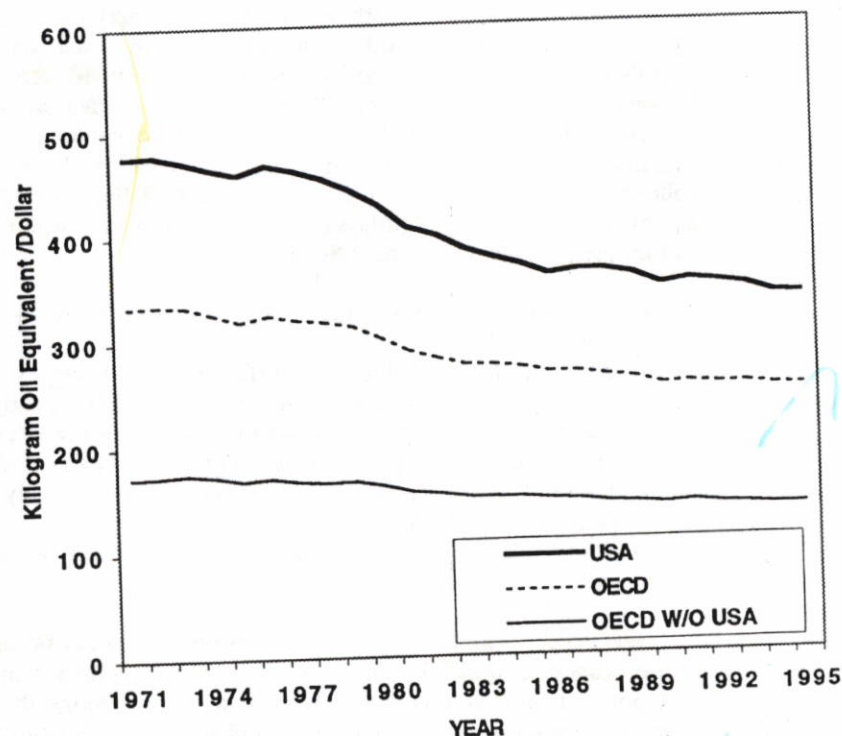


Figure 7.2 Total primary energy supply per one dollar domestic production: 1971 to 1995. (Source: United States Statistical Abstracts, 1973–1997 International Energy Agency, OECD Countries Energy Statistics, Annual.)

\$1 of domestic production in industrialized countries. The U.S. uses more than three times the amount of energy for an equal amount of production than other developed countries.

Looking at energy we can see the difference commoditization makes. Assuming that energy efficiency makes sense, there are three possible approaches and technologies that could be developed, in descending order of commoditization potential:

- To develop and exploit ever higher quality fuels so that more of the energy embodied in fuel can be delivered at the point of production of a good or service and less is dissipated and lost (fuel efficiency)
- To reduce the amount of fuel required to produce any commodity (production efficiency)
- To organize human communities in such a way as to reduce or eliminate the need for the commodity (consumption efficiency or decommoditization).

Each approach requires the application of creative problem-solving and cooperative efforts, and each is capable of reducing the amount of energy used per unit of service, but each has not and could not receive equal amount of attention and research and development because of the differences in commoditization potential. The advances made in fuel and production efficiency have far exceeded the advances made in consumption efficiency.

That the greatest amount of effort has gone into improving fuel quality is consistent with the rule of commoditization. High-quality fuels are those that are most commercially useful, meaning they exist in concentrated forms, are relatively easy to store and transport, and can be most efficient and productive in powering work. In short, the higher the quality of a given fuel the more it contributes to overall commodity potential in an economy. Technological innovation has been directed toward making it possible to obtain and market fuels that pack a greater wallop per dollar invested. Thus the history of industrialization has been marked by transformations and improvements in fuel quality, starting with biomass fuels (mostly wood and peat and whale oil), then moving to coal once the technologies of mining and earth moving were developed, then to oil and gas once the technologies for drilling and refining were developed. Centralized electricity generation and distribution made it possible to deliver energy where and when it was needed at a considerable distance from the fuel combustion site.

Advances in production and transportation efficiency have led to reduced costs of production of commodities, making them increasingly less expensive and more developed than noncommodities. Since the invention of internal combustion engines, the history of industrial technology can be seen as the utilization of ever-increasing amounts of higher-quality fuels, at ever-increasing efficiencies to replace and/or supplement human driven work. Labor productivity increased more than a 100-fold since the industrial revolution by substituting energy for human labor. This substitution greatly enhances commoditization, because labor is far less commoditizable than energy. The labor released from production in a commoditized economy must seek out employment in commoditized service industries, which also expands commoditization there. Over time fuel replaces workers in these industries as well and another round of commoditization ensues. Without some counterbalancing decommo-
dization force that replaces energy with human labor and creativity the mobilization of energy and materials must continue with all the accompanying environmental and social costs.

Both fuel efficiency and production efficiency is consistent with the imperatives of commoditization and therefore have been subject to considerable development in modern economies. The third form of energy efficiency, consumption efficiency, is antithetical to commoditization and in fact might be called decommo-
dization. The tools and skills of energy efficiency at the point of consumption belong in the hands of the final user, not the energy producer. This path to efficiency has simply not been tried to any great extent.

The story of the centralized production and distribution of electricity is a good example of how development gets distorted by commoditization. The distribution of electricity through the power grid results in considerable losses in fuel-to-work efficiency (most plants operate at around 35% efficiency, meaning they produce two units of waste heat for every one unit of electricity produced, and even more is lost in distribution and end use). This efficiency is sacrificed for improvements in centralization of power and ownership, convenience and portability, qualities characteristically favored by commoditization.

While the commoditization of energy has driven enormous technological changes, there has been little in the way of comparable advance in the technologies of end-user efficiency. Such technologies include building design and location for passive solar heating and cooling, small-scale jerry-rigged windmills and farm-scale methanol production, small scale neighborhood energy storage, as well as many reduced consumption alternatives such as neighborhood equipment and tool libraries, energy-efficiency design cooperatives, and many others. Such advances require specific technical innovations at the point of use. Such technical advances are far less commoditizable because they necessarily involve decentralized, site-specific problem-solving. The point is not that these three energy paths — fuel efficiency, production efficiency, and end-use efficiency — are mutually exclusive, but that commoditization creates a severe imbalance in allocation of research and development resources so as to overdevelop certain aspects of energy production and use while underdeveloping key technologies that could dramatically reduce the amount of energy used to support a high quality of life.

This imbalance will only grow more important as we approach the limits to how much energy wastage the planet can tolerate. As readily available sources of high-quality fuel become more scarce, the amount of effort and energy required to obtain, process, and transport a given quantity of energy rises, thus threatening the continued advance in net energy productivity and increasing the amount of resource depletion and waste per unit of energy delivered. Energy in the forms of high-quality fuels capable of powering economic activity can only be used once. Every gallon of oil burned is permanently lost, while the supply of fossil fuel is 1 gallon diminished. Fossil fuel and other highly concentrated forms of energy resources are necessarily nonrenewable. As time goes on the highest quality and most easily extracted and processed fuels are used first. The cost in energy of producing more energy continues to rise. At some point the cost in energy expended is equal to or greater than the amount of usable energy obtained, at which point improvements in technology, or new sources or new fuels are needed to increase the energy return on investment or else economic advance must begin to slow and eventually stop. Other resources can also be evaluated for quality in terms of the amount of energy needed to transform the resource into an economically useful form. All of these analyses emphasize the absolutely critical role of energy availability and quality in all aspects of the human economy.

The evolution of human civilizations is sometimes described as the story of converting potential energy into useful forms. The story begins with the domestication of fire, then tells of the invention of the wheel and the harnessing of wind energy in ship's sails. With wheel and sail comes the power to move people, armies, and goods across land and water. These give military advantages in particular to those societies whose economy and technology become dependent on conquest and exploitation. As we saw earlier, commoditization took root in these societies and began to overdetermine technological evolution, beginning with the industrial revolution and the expansion of colonialism and imperialism.

The conundrum facing modern industrialized societies is this: increasing economic development and human prosperity has up until now been directly correlated with increasing energy use.¹² Most economic projections at the end of the twentieth and start of the twenty-first centuries assume that economic growth, particularly enhanced by the aspirations of the majority of the world's people to attain standards of living comparable to the industrialized minority, will lead to dramatic increases in energy consumption. With current trends these energy demands are likely to be met by non-renewable fossil fuels, with all the accompanying increases in pollutants and CO₂ emissions.

We'll have to get a whole lot more efficient in our use of energy in order to avoid global environmental calamities. Reddy and Goldenberg (1990) have argued persuasively that it is possible to raise living standards in the South to a standard equivalent to that enjoyed in Western Europe in the 1970s with a flow of about 1 kW of energy per capita used continuously, a small fraction of the energy presently consumed per capita in the rich industrialized countries today. This level of energy efficiency, however, would require massive changes in patterns of energy use amounting to a decommo-
dification strategy that would rely heavily on production and end-use efficiency and on generating energy as synchronously as possible with the ultimate use. What Reddy and Goldenberg concluded will sound familiar to the reader by now. "A new paradigm for energy use is therefore essential. Energy must be viewed not as an end in itself or as a commodity but as a means of providing services."¹³

The laws of thermodynamics place real limits on improvements in energy efficiency. There are also serious and growing limits to the ready availability of high-quality fuels, which make efficiency improvements even more difficult to obtain. Although there is considerable room for improvements in energy efficiency, most of the energy-saving prospects, such as decentralization of energy production and technological advances in conductivity, require redesign and restructuring of current industrial and energy production and distribution facilities. The massive energy and material costs to carry out this restructuring is often not considered in the calculations of prospective energy savings. Lastly, without a strategy of decommo-
dification no amount of efficiency gains are likely to help. Two thirds of the energy used in industrialized countries like the U.S. is used

in transportation and in home heating, lighting, and appliances. There are tremendous efficiency gains to be made in these areas, but they are inherently decentralized and labor-intensive and thus involve low commodity intense skills and services. As long as commoditization favors the centralized and the capital intense, these efficiency gains will be not live up to their potential. In an economy under heavy commoditization pressures what happens with a dollar saved when efficiency gains lowers energy costs is more than likely spent on another commodity, in effect increased efficiency leads to increased consumption.

This has been the case in the history of industrial development. Most of the efficiency improvements to date resulted from improvements in the quality of the primary fuel being used. This efficiency trend has been consistent with commoditization as high-quality fuels also have greater commodity potential. Each step in the technological progress of fuel from wood to coal to oil has seen an improvement in energy density and the capacity to store and transport energy. It's worth noting that each step also represents a decrease in the carbon/hydrogen ratio of fuel, meaning less CO₂ is emitted per unit of fuel burned. Yet despite these improvements, because of commoditized economic growth the total amount of carbon dioxide added to the atmosphere continued to rise dramatically throughout the evolution of efficient and cleaner fuels. The fact is, energy efficiency programs will only be successful in uncoupling improved quality of life from increased energy use if it is accompanied by a political and economic strategy to counteract the effects of commoditization. Without it, improved efficiency leads to lower costs and increased consumption. This paradox is sometimes referred to as "Jevons' paradox" after economist Stanley Jevons pointed out in 1864 that efforts to conserve English coal by increasing the coal-use efficiency of British steam production ended up making steam power cheaper compared to human and animal power and in the end stimulated increased coal consumption.¹⁴ Fuel efficiency gains made in automobile engines have had similar effects. A study by Freund and Martin (1993) demonstrated that even though the efficiency with which automobiles used gasoline in the U.S. improved considerably (34%) between 1970 and 1990, total fuel consumption during the same period increased by 7%, because the number of multi-car families had increased and the family drove more miles.¹⁵ Fuel efficiency gains have also been erased by the increasing size of the American car as sport utility vehicles and minivans have gained in popularity.

Many analysts have pointed out that in order to meet the need for economic growth in the Third World without dramatically increasing the amount of global environmental stress, there needs to be an order of magnitude (a factor of 10) improvement in the amount of material and energy used per unit of service provided.¹⁶ Such efficiency improvements, while theoretically possible, cannot merely lead to producing more goods and services with less energy per unit, but also must satisfy human needs with fewer goods and services. This, as we have seen, is opposite of what happens as a result of commoditization.

How dependent are we on increasing energy use to achieve and maintain prosperity? The data are clear showing a direct correlation between the two measures.¹⁷ But these data are misleading because of the distortions of commoditization. Prosperity in this formulation is measured in dollars of per capita GNP, so what is being measured is the total amount of goods and services moving in the economy, which of course, requires vast amounts of energy for production and distribution. The very definition of prosperity is directly tied to energy use through commoditization. If it is possible to break the hold commoditization has over our economies, which I believe it is, than the hard link between well-being and energy use can be overcome to a considerable extent. In fact, improvements in a measure of well-being per unit of per capita fuel consumption would be an excellent indicator of progress in the decommo-ditization of an economy. It would also provide an excellent measure of the capability of a society to meet the needs of its people without damaging the natural world within which they live.

In 1985 Jose Goldemberg reported on the results of his analysis of the relationship between per capita energy consumption and the measure known as the Physical Quality of Life Index. The PQLI combines three measures that often are used as a way of quantifying the level of well-being in a country: infant mortality rate, life expectancy, and literacy. According to Goldemberg, "When the PQLI is plotted against per-capita energy use (commercial plus non-commercial) for a large number of countries, it is found that on average a PQLI of about 90 (a value typical of industrialized countries) is reached for per-capita energy use rates of 1.0-1.2 kW, and that further increases in energy use cause only a very marginal further increases in PQLI."¹⁸ There was considerable variation in the data, and some countries reached a PQLI of 80 with only 0.5 kW per capita, while others achieved 90 with 1 kW.

How would technology evolve in a society not distorted by commoditization forces, a society that truly took account of the reality of entropy and was interested in energy efficiency? Design would begin with two questions: first, how can the need for transportation, food production, clothing, etc. be met using the least amount of energy and materials and second, how can the natural flows and cycles associated with the landscape and climate of a particular place be utilized so that no energy is wasted fighting against or unnecessarily altering the patterns of natural flow. Under the rule of commoditization these questions are rarely even asked. The answer to the question of whether the hard link between prosperity and energy use can ever be broken, depends entirely on whether we can get ourselves out of the commoditization trap and turn our attention to making real progress in designing, engineering and living with considerably reduced flows of energy and materials.

Once we shift economic goals from growth in the production of commercial goods and services to improving quality of life, the concept of efficiency takes on dramatic new meaning. E. F. Schumacher, evoking what he called a Buddhist economics, described the flaw in the standard notion of efficiency in his classic book *Small is Beautiful*. The modern economist,

according to Schumacher, "is used to measuring the 'standard of living' by the amount of annual consumption, assuming all the time that a man who consumes more is 'better off' than a man who consumes less. A Buddhist economist would consider this approach excessively irrational: since consumption is merely a means to human well-being, the aim should be to obtain the maximum well-being with the minimum of consumption."¹⁹

The problem with Schumacher's and similar analyses is that they consider consumerism to be a personal, individual weakness rather than a pattern of behavior that is systematically reinforced by the structure of society through commoditization. Of course, greed and superfluous consumption can be overcome by individual decision, but it would be far easier for many more people to make that decision if society intentionally reinforced and rewarded frugal behavior and community-building activities. The policies that follow from the spiritual criticism of consumerism are the policies of personal change. Although conversion can powerfully influence behavior, the force of commoditization is systemic and powerful and largely independent of individual beliefs. That is why the economies of nominally Buddhist nations are as subject to commoditization as the most materialist, secular nations. Only through policies that address commoditization by rewarding thrift and penalizing waste can energy conservation be systematically internalized in the economy.

The technology of real energy conservation consists of goods and processes with inherently low commodity potential and commoditization has steered development away from them, including:

- An organized, well-supported infrastructure for product sharing, leasing, repair, and maintenance
- Improvements in reusability and recyclability of all goods
- Design and production in cooperation with natural flows of material and energy rather than against them
- Flexible design encouraging multiple uses for specific contexts
- Production designed for durability and simplicity of use

As we will see more fully below, these approaches suffer from an R&D famine precisely because each involves skills and practices that have inherently low commodity potential despite enormous social and environmental value.

7.2.3 Efficiency is enhanced by working with natural flows and processes rather than against them: the principles of appropriate technology and ecosystem thinking

Implication: Technology should be designed to work with rather than against natural flows of energy and materials.

The only sensible way to increase prosperity while decreasing energy and material usage is to design and produce everything with conservation and

efficiency in mind from the beginning. The skills and knowledge to do this are widely available, and terribly underutilized. There has been nearly 30 years of independent, underfunded creative experimentation with what has been called "appropriate" or "alternative" technology.²⁰ Most such technology is based on working smart with the fewest and least environmentally disruptive of available materials derived from renewable sources, renewable energy, and designing *with* rather than *against* natural flows and local natural conditions. They require simple skills and tools familiar to any tinkerer or do-it-yourselfer and are relatively simple to build, maintain, and repair. The skills required to be an appropriate technologist are intimate, detailed knowledge of energy flow, experience with a variety of available materials, detailed knowledge of the intended use or service, basic skills of mechanical design and engineering, flexible problem-solving skills, and teamwork and leadership skills, since no one should have to cultivate all these skills alone.

When you utilize the energy of the wind in a sail or a windmill, you do not reduce or degrade the wind. When you design a home to soak up and store the warmth in its solar facing wall, you do not degrade the sunlight. When you work with organisms and compost to build soil you direct and enhance natural processes. When you utilize the energy of falling water to turn a mill you do not degrade or reduce the water. If you use wood at a rate no greater than it can grow you sustain the resource. Working with natural flows saves energy; working counter to natural flows expends energy. Real-life solutions to the problems of energy and materials conservation will include both hard technologies based on fossil fuels and soft technologies that utilize sources of renewable energy. There are no formulas for appropriate technology: that is its strength and its difficulty.

Serious conservation of energy requires a careful study of natural flows and possibilities of benefiting from their work: the flow of sunlight, the flow of water, the flow of wind, the flow of minerals, and the flow of nutrients. This is the heart of appropriate technology: observation, understanding, design, testing, and refinement through practice. Appropriate technology rests on the tinkerer's art. It always and profoundly resists standardization, packaging, and many of the other features of commodities. That is the biggest problem for appropriate technology in an economy subject to heavy commoditization pressures. This is why the practice of appropriate technology has remained largely underdeveloped despite centuries of slow and careful research and development by indigenous engineers everywhere in the world. The possibilities for appropriate technology are enormous and virtually untapped compared with, for example, the possibilities of packaging and transport.

The potential has been demonstrated by countless examples, none more remarkably than in the intentional community of Gaviotas in Columbia. With limited resources and geographic isolation, the innovators of Gaviotas have invented numerous small-scale systems that work with low-cost materials and minimal energy input. They have relied on continuous experimentation

and the knowledge they gain from close observation of the ecosystem they occupy. As Alan Weisman describes in his book on Gaviotas:

In 1971, a group of Columbian visionaries and technicians, reasoning that surging populations must someday learn to inhabit even the world's harshest regions, decided to prove they could thrive in one of the most brutal environments on earth: their country's barren, rain-leached eastern savannas.... Sixteen hours from the nearest major city, they invented windmills light enough to convert mild tropical breezes into energy; solar collectors that work in the rain, soil-free systems to raise edible and medicinal crops, solar "kettles" to sterilize drinking water, and ultra-efficient pumps to tap deep aquifers — pumps so easy to operate, they're hooked up to children's seesaws.²¹

Not only did they succeed over more than 25 years to build a model sustainable community, but "in the shelter of millions of Caribbean pines, which the Gaviotians planted as a renewable crop, an unexpected marvel has occurred: the regeneration of an ancient native rain forest."²² Through ingenuity, experimentation, hard work, and respect for basic ecological principles, the Gaviotians appear to have succeeded in building a human settlement that not only protects the natural environment, but enhances it.

The greater the ecological flow or force, the greater the amount of energy required to contain or disrupt it. For example, trying to contain a major river within its banks and insuring property owners against flood damage can be extremely energy inefficient compared with avoiding permanent settlement of the flood plain to begin with. The experiences with flood control in the U.S. is a good example. While U.S. federal flood control expenditures increased dramatically each decade from the 1920s to the 1960s, so did the amount of flood damage. Flood control efforts succeeded in protecting property from the *average* flood, but when storms and flooding were extreme the resulting damage was far greater than had been the case prior to the institution of the flood control programs. The flood control program and subsidies for property insurance had encouraged construction and development in many parts of the floodplain that had once been frequently inundated and therefore left undeveloped. Now when flooding does occur, there is far more real estate in its path and far more damage as a result. Furthermore, where in the past a flood might typically spread out wide and relatively shallow across the plain, now with the river confined to channels by levees, the floodwaters reached new and dangerous heights, causing floods in unleveled tributaries that would not have flooded before. Some rivers, particularly with large sediment loads, regularly shift channels as sediment build-up changes the patterns and gradients of elevation. Rigid flood control structures prevent

channel-shifting, which means sediments continue to build up and dangerously raise water levels in the channel. Sediment management then also becomes an energy-intensive part of flood control to replenish and/or protect downstream deltas.²³

Trying to stabilize anything dynamic requires energy, sometimes huge amounts of it. Humans routinely intervene in natural systems to make them more stable and predictable, and each intervention exacts costs in terms of energy demands and unintended consequences. We are in a tragic situation in that we must attempt to control the forces of nature for the comfort and safety of our loved ones and ourselves, but when we do so we must pay in ways that are sometimes as costly and damaging in the long run as the hazard we first attempted to avoid. The solution, if there is one, lies in a deep and detailed awareness and understanding of natural flows and processes so that instead of battling flows and stabilizing natural variability, we can accommodate and adapt ourselves and our technologies according to our best current understanding of ecosystem processes. When this is done at the relatively small scale of the individual or village, it is called "appropriate technology"; on the larger scale of a bioregion or ecosystem it is called "the ecosystem approach to resource management and economic development." The most important element for success with these approaches is a deep and detailed understanding of the properties of a given ecosystem, being able to design interventions that fit unobtrusively into that system, and moderate the impacts of human activities and the human economy on the system as a whole. The problem is, once again, that understanding systems requires a form of science that is inherently multidisciplinary, difficult, and time-consuming while resulting in knowledge that has little if any commodity potential. As a result, this science is starved for the kind of research and development it desperately needs.

Like the shifting channels of a river, most natural ecosystems are dynamic. Variability and change is a constant feature of nature. The natural history of most areas results in a patchwork rather than homogenous landscapes. Different parts of the system are subject to various cycles at different rates that affect key aspects of growth and development. Many of the features of an ecosystem exist precisely because it experiences periodic events of destruction by fire, flood, drought, disease, insect infestation, or other cataclysmic events. In the long natural history of many ecosystems, the native species have evolved mechanisms to survive the periods of high stress, and many require such outbreaks of creative destruction in order to reproduce and survive. When this variability — be it fire, flood, infestation, or other natural "disaster" — is reduced to accommodate the human need to impose order and stability, then the condition under which the ecosystem had evolved is fundamentally altered, and gradually the ecosystem itself is transformed and the plants and animals depending on it are lost. Human enterprise often attempts to create homogenous landscapes — be they vast fields of corn or vast stretches of highway, or placid, easy-riding rivers — out of what was once patchwork. As this happens more and more throughout the

world, the diversity of nature, based as it is on the diversity and variability of ecological conditions, gradually becomes homogenized.

C. S. (Bud) Holling studied 23 examples of managed ecosystems from different parts of the world.²⁴ In each case, the effort to suppress variability and to maximize a single target, socially beneficial variable led inexorably to decline and in some cases destruction of the managed ecosystem. Natural cycles affect the reliability of harvest: for example, periodic outbreaks of spruce budworm in the eastern North American spruce/fir forests or outbreaks of fire in the western U.S. Sierra Nevada forests greatly reduce timber harvest; widely varying numbers of salmon in western U.S. streams lead to boom and bust cycles for the fishermen; varying density and species mix of rangelands lead to rising and falling beef production, and so on. Holling showed that in each of these cases resource managers attempted to stabilize natural variability. The budworm are attacked by insecticides, the fires suppressed, the grasses maintained with modern rangeland practices, the salmon stocked at varying rates to keep harvest numbers steady. What happened is that, without the variability, instead of many patches of varying ages and stages of impact or recovery, the ecosystem became more homogenous. Then, for example in the forest, when an outbreak of insects or fire did occur, which it inevitably did no matter how successful the suppression, it was far more destructive. Likewise, management practices turned rangelands into beds of highly productive but drought-sensitive grasses. Under drought conditions the range turned into a virtual desert with a few shrubs.

It is certainly rational for producers to attempt to minimize sudden fluctuations in yield or output. Predictable, preferably steady supplies of output are one of the defining characteristics of a successful commodity. Harvesting natural resources in a highly commoditized economy requires massive investment in equipment and labor. Predictable yields are needed to satisfy the demands of the investors. Without ecologically based policies to counteract the effects of commoditization, the logic of exploitation is inevitable and inevitably destructive. For the rational market-driven actor, there are really only two options: sustainable yield, which implies suppressing the variability of the commodity being produced, or worse, massive one-time harvesting as in clear-cutting rainforests and placing the one-time income into other investments with greater or more steady economic yields. The logic of commodity production is powerful. More ecologically based resource management alternatives inevitably have lower commodity potential because they require less capital and more labor; they require intense personal knowledge of the underlying ecosystem and rely on the existence of a mixed local economy where local timber suppliers are in active social relationship with timber consumers. For ecosystem management to be successful, a balance must be struck between commodity production and conservation of noncommodity values. That requires a coordinated system of economic and social policies to counter commoditization pressures and promote ecologically informed, ecosystem-based management.

As a guide for making judgments and determining right action, the most important principles of the ecosystem approach are as follows:

1. Our notion of community (and our responsibilities toward it) should include soils, water, plants and animals, and the system features that emerge from their interrelationships, or collectively: *the ecosystem* including the people who live on it and are shaped by it.
2. We should design management strategies for not just any ecosystem, but for specific ecosystems each with its own physical and biochemical construction, energy flows, and history; what is sometimes called "site-based management."
3. We should recognize that the natural history of ecosystems ultimately determines the sustainable productivity of any natural resource.

Governments are increasingly giving expression to ecosystem concepts such as the following example from Canada's Green Plan:

We live in a complex and integrated environment. All creatures, including humans, interact with and depend on each other. They all draw on the materials and energy of the physical environment to obtain food and recycle wastes. They all affect each other's behavior. In the past, responses to environmental problems paid little attention to these interrelationships. Today, the increasing number and complexity of environmental issues demand that we adopt a more integrated approach.²⁵

Such pronouncements can be found in countless documents in countries all over the world. They ring hollow as long as the governments remain locked into a system of continuing economic growth based on commoditization. Economic and social reforms such as those discussed in Chapter 8 are necessary before ecosystem approaches to management and appropriate technology can become predominant in the economy.

Serious energy and material conservation involves not only designing tools but also communities, workplaces, transportation systems, and schools with ecological principles in mind. The most effective energy and materials conservation efforts involve integration and multidisciplinary cooperation to accomplish rational, efficient design: neighborhoods and downtowns built for walking and biking, bikes integrated with public transport, schools and factories integrated with transportation systems, heating and lighting integrated with landscape design, economic development integrated with land use planning and environmental protection. Such levels of integration require ecologically informed, broad participatory planning far beyond the capacity of our present governance systems.

Greater integration of production and consumption is also the key to reducing the incredible amounts of waste produced by modern economies. In nature, everything depends on cycles and loops. The waste from one activity becomes the source of energy (food) for the next activity. Considerable energy and materials efficiency could be gained by designing our systems of production and consumption so that every product or by-product of a process becomes an input for another process.

The trends driven by commoditization, however, go in just the opposite direction: toward easy transport, quick consumption, and ready discard. Most commodities follow a one-way, linear path from producer to consumer to the landfill or incinerator. To transform this waste-making machine into an economic system designed for efficient use of materials and energy requires that producers take responsibility for what is sometimes called the complete life cycle (cradle-to-grave) of their products. This is also referred to as *extended producer responsibility*.²⁶ With such responsibility would come the incentive to design long-lived products with consideration of their end use and/or reuse. Extended producer responsibility also would require integrating consumers and producers into closely aligned systems of materials management in which producers and consumer relationships continue throughout the use of the product. Leasing would become a viable option for most major appliances and things like carpeting. After the lease period ended, the producer would take the product back for repair or recovery of materials.²⁷ In effect, markets for major goods would shift to markets for the services which the goods provide.

Energy efficiency and appropriate technology, like everything else, is subject to commoditization pressures. There is a market for energy-efficient products, a market that would surely grow with increased energy prices. But such efficiencies, in and of themselves, will not decrease energy use if the dollars saved are merely transferred to the purchase of other commodities. Likewise, a market exists for the tools and skills of appropriate technology, and there is many a do-it-yourselfer who, as a leisure time activity, is retrofitting her home. Middle-class Americans and Europeans are experimenting with many forms of eco-villages and super energy efficient homes, which by themselves simply become a housing specialty market. The wholesale adoption of ecological technology and ecosystem approaches will require real change in the system of economic incentives that presently drive commoditization.

Fundamental to the successful adoption of ecologically sustainable ways of life is a significant shift in perspective by enough people so that the values of simplicity, grace, and connection with the natural world become predominant in society. Many observers and activists place their hope in environmental education and the widespread adoption of environmental ethics. Although both are extremely important, without change in the system of economic incentives, environmental awareness and the fostering of feelings of deep connection with the Earth will remain specialized areas of interest for a minority of self-selected individuals. Feelings of concern for the health of the

environment and connection with the natural world can then be appealed to for the marketing of commoditized eco-goods and services, such as eco-tourism and wilderness gear. Although a small but significant lobbying voice for environmental protection can be organized and politicized around these feelings, the majority of society will continue in its profligate and carefree pattern without real economic changes that address the problem of commoditization.

The prerequisite for living out an environmental ethic is awareness. One cannot care about what one does not know, and certainly one cannot protect what one does not understand. We cannot follow the ecological principle of designing with nature if we do not understand nature's designs. As the need for environmental awareness grows, the reality, driven by commoditization of the land and agriculture, is that fewer and fewer people are actively engaged in working on the land and developing an intense consciousness of nature. It is not that people are not spending more and more time in nature as spectators or in various forms of outdoor recreation, but such is a very different experience from slow and careful work of cultivation and husbandry, requiring attention and observation skills of another level than sightseeing. While the intellectual content of environmental ethics has grown with a great number of publications and courses dedicated to articulating and further elaborating the arguments for such ethics, the practical relevance of its ethical principles remains about as marginal as it was when Aldo Leopold wrote his famous prescription.²⁸ The irony of the evolution of environmental ethics is that as its intellectual content has grown, its existential content has probably declined. Our ability to act on that ethic in a meaningful way has been reduced correspondingly.

The child in third grade who learns, as Leopold hoped she would, ecological principles, can think of no real application of that knowledge other than to use two sides of a sheet of paper to spare a tree. Meanwhile, her world is a cacophony of manufactured materials, much of it produced in ecosystems thousands of miles away, over which she has no control. Leopold wrote that, "perhaps the most serious obstacle impeding the evolution of a land ethic is the fact that our educational and economic system is headed away from, rather than toward, an intense consciousness of land." Activities that foster an intense consciousness of land — working soil, shaping materials, gathering food — remain segregated in arts and crafts and field trips to zoos and nature centers. Despite the best intentions of environmental educators, the environment remains, in this context, another form of entertainment.

Commoditization creates an economic selection pressure that maximizes the attributes of commodities as described throughout this book. Nearly every analysis of how to reduce our economy's negative environmental impacts concludes with some version of recommending that we redesign our economy and its industrial and commercial tools in ways that mimic the cycles and flows of nature. But the very attributes we want to mimic in nature are incompatible in many ways with the attributes that make something a successful commodity. As commoditization operates over time, therefore, it becomes increasingly difficult to follow the guidance of

the natural world even as we learn more and more about the ways nature works and the importance of following its dictates.

7.2.4 Contradictory goals cannot be maximized at the same time and must be balanced: The principles of homeostasis and optimality

Implication: Information indicating that the human economy is out of balance with nature must be received and processed and adjustments made to optimize the sometimes conflicting goals of prosperity and ecological integrity.

Life is full of contradictions that can never be fully reconciled; they can only be balanced while we do our best to navigate some optimal middle ground, like Goldilocks choosing not too hot and not too cold, not too soft and not too hard, not too fast and not too slow. Every action, every creature, and every life operates best under optimal conditions that represent a balance between countless variables in complex patterns of relationships with each other. This is also true of nonliving matter as well. Each structure represents a temporary point of stability between several chemical, physical, and biological forces acting upon matter in often conflicting ways. Within these points of balance life evolves in wildly diverse ways that take advantage of flows of energy and nutrients temporarily made reliable and semipredictable by the improbable structure. **Structure is always a highly improbable balance temporarily achieved between counteracting forces.** If any one of these forces happens to be maximized to the loss of the others, then the structure is destroyed. Although no single force is ever maximized in any structure or life or pattern of any kind, each is being optimized in relation to each other. **This optimum is always temporary, because everything is changing over time and as each variable changes all the others react.** The miracle of life is how much stability actually exists over time. **The way life maintains stability is what we call homeostasis, the ability or tendency of an organism to maintain internal equilibrium of temperature, fluid content, and countless other variables by the regulation of its own internal physiological processes and by automatically adjusting to changes that occur in the external environment.** The most important aspects of successful homeostasis are:

- The capacity to continuously gather, receive, and evaluate information coming in from the environment.
- The ability to respond appropriately to the information by adjusting internal conditions in ways that maintain favorable balance.
- An external environment governed by its own homeostatic mechanisms that maintain conditions roughly within the range of extremes of the particular species' evolutionary experience.

Homeostatic mechanisms exist at the level of the cell, the organ, and the organism. Organisms interact in complex relationships with each other and

their shared environment and maintain some stability over time in recognizable ecosystems such as lakes, forests, deserts, fields, and prairies, each with its own characteristic group of organisms that have evolved within the conditions each creates for and with the others. The homeostatic processes of ecosystems maintain conditions within ranges of extremes, which thus enhance the long-term survivability of the component species of organisms that utilize the resources of a given ecosystem. The Earth as a whole likewise maintains stability through complicated feedback mechanisms that constitute a form of homeostasis at the planetary level. Balance is achieved among many counteracting forces and is sustained as long as no single variable is maximized at the expense of the others.

Tradeoffs in nature are similar to the experiences we have in our daily lives. In nature much of the tradeoffs have to do with efficiently obtaining, allocating, and using life's primary scarce resource, fuel (food), to survive and then reproduce. The energy that goes into mating may be lost to feeding, while that which powers transportation may not be available for mating. What can be done quickly often cannot be done efficiently. What can be done efficiently often cannot be done on time. The economy of life's energies can be balanced in countless ways, and the millions of species of plants and animals each represent another set of balanced solutions to the problem of survival and reproduction.

The goal of economic development is often to maximize single variables in complex ecological relationships, variables that are favorable in some ways to humans. Thus agriculture is the attempt to maximize the yield of harvestable nutrients by manipulating the environment in such a way that more of its energy goes into the production of these nutrients. Manipulating the flows of energy and nutrients in the environment to maximize the production of beneficial products is the very essence of the human economy. But the more we attempt to maximize certain attributes over others, the more we manipulate the natural environment, the more energy is required to sustain production at this new imbalance. Intelligent management of the environment, based on conserving materials and energy, would require minimizing the amount of overt manipulation of the environment that is done to maximize economic production. The goal of the new economy should be to achieve optimal human welfare with the minimal of environmental disruption.

Homeostasis is very much about information processing. Human intelligence is an advanced homeostatic tool. It not only takes in information and compares it with some decision rules programmed into it by evolutionary experience, but humans can make judgments apart from rules, forecast, learn from others' experiences, and think about the meaning and method of intelligence itself. Intelligence allows us to continually evaluate our environment and change our behavior accordingly. We also work cooperatively with each other in complex social systems designed, at least in part, to optimize the well-being of all its members. This is the most hopeful fact of our current environmental predicament. Humans have the real capacity to learn from the environment and make adjustments. If the human economy is organized in ways that are

threatening to disrupt the Earth's homeostasis and balance, then humans have the capacity to recognize this fact and adjust the economy accordingly.

We simply cannot maximize production or continually manipulate the environment to maximize material satisfactions. The best we can do is to find a reasonable balance in which we optimize material well-being within self-imposed economic constraints designed to protect the balance and stability of the Earth's life support systems.

The environmental crises, both current and to come, demand that we manage our impacts on ecosystems in ways consistent with our understanding of ecological principles. There is no way to avoid the need for effective economic policy informed by ecological principles. Commoditization will often create positive feedbacks where negative ones are what is needed. For example, when a resource begins to become depleted (fish, for example), economic signals cause the price to rise. As a result of rising prices, harvesters (fishermen) are encouraged to invest more to improve yield to obtain more of the product at the higher prices. The better equipped harvester just hastens the collapse of the resource (fishery). This is played out over and over again with scarce resources. Optimistic free-market economists argue that higher prices encourage the development of substitutions for scarce resources (plastic for wood, synthetic fibers for wool, rayon for rubber, aquaculture for fishing) and decrease the pressure on the resource. Although this has been true on occasion, each of these substitutions involves synthetic substitutes that not only increases the amount of fossil fuel energy embodied in each unit of product but also often create vast new quantities of waste, many of which involve new synthetic chemicals that do not break down in the environment. The end result of these substitutions driven by commoditization is an increase in energy use and pollution. The logic of a system (the economy) and a discipline (economics) that cannot value Nature, only its economic functions, is an illogic that distorts our thinking and sickens our Earth.

7.2.5 Scale and level of organization matter: the principle of cooperative hierarchical organization

Implications: Economic policy decisions should simultaneously consider effects at the level of the individual, the level of the economic system, and the level of the global ecological system.

For any structured activity in nature there is an optimal size. When designing systems to serve human welfare with the least environmental impact, the appropriate scale of the system is an important consideration. If the purpose is to maximize the production of marketable goods and services the infrastructure may be designed to operate at a very different scale than if the goal is to optimize human welfare in conjunction with minimizing environmental impact. In most but not necessarily all cases, the scale of industry designed to maximize commodity production will be much larger than the scale for energy-efficient human welfare optimization.

Ecologists often think of the world in terms of hierarchies of scale: molecules—cells—organisms—ecosystems—biomes—biosphere—solar system—universe. A forest has many energy and material flows that exist at different scales and rates of exchange and operate at a particular scale of organization: the cellular level, the level of leaf litter and soil, the level of the whole tree, the level of the stand, the level of the forest ecosystem, which interacts with and is affected by surrounding conditions up to the level of the biosphere. Depending on what you want to know about how the forest functions and what you want the forest to provide, you may ask questions focused at completely different scales and sets of exchanges. For example, you might ask how does a plant capture energy from the sun? or How is forest soil produced and reproduced? or Who eats whom among the creatures of the forest? or What conditions are optimal for the production of hardwood for mills? What conditions are optimal for the production of pulp for paper? What conditions are needed for the forest ecosystem to be sustained indefinitely into the future? It's important when seeking answers to questions about any multilayered system to target one's observations and measures at the appropriate scale.

Our human institutions have been largely shaped by the needs of commoditization. Our capacity to act collectively has also been similarly distorted by commoditization. The boundaries of local jurisdictions are usually artifacts of recent history. They either served the convenience of colonial administration, trade routes, or the land survey that preceded the sale and enclosure of once open or public lands. Throughout history, governance and regulatory authority has shifted to different scales along with the expansion of trade and the interest of establishing common standards for commerce and the enforcement of contracts throughout an economically integrated area. At the end of the twentieth century and the beginning of the twenty-first, we are witnessing the growing integration of the commoditized economy at the international and global scale and an increasingly powerful set of global institutions whose task it is to encourage commoditization worldwide and facilitate the further integration of the global economy. We now have a hierarchical pattern of institutions that encourages the flow of commerce at the local, subnational, national, international, and global scales. At present there are only weak institutions whose interests lie in the welfare of people and the protection of ecosystems from the effects of all this increased commoditization.

If we are to have the ability to effectively defend the environment, promote conservation, and provide countervailing pressures to commoditization, we will also require the ability to act collectively at the scale most consistent with ecosystem levels of concern, be it local, regional, or global. As long as commoditization drives human activities, the scale of human intervention will remain at the level at which commodities function. If we want to manage processes as well as products, systems as well as commodity movement, then we will need new structures of governance that create the possibility for people to act collectively at the appropriate level. Some possible suggestions for how this might be organized are discussed in the next chapter.

7.3 Conclusion

The field of ecology has taken great strides in demonstrating its relevance to economics, so much so that economists ignore the conceptual frameworks and warnings of ecologists only at great peril to their profession and to the world. Indeed, ecology is more even than an academic counterpart to economics, but should better be understood as a metadiscipline without which economic analysis is fundamentally incomplete and inadequate to make long-term projections of economic development. As the analysis in this chapter has sought to show, we cannot understand our present economic condition or make rationally justifiable decisions about our economic future without taking into consideration ecological principles that simultaneously make opportunities available to us and constrain our options. If we intelligently apply ecological principles to our economic analysis and decision making, then we will have many more opportunities than constraints. If we wait to analyze our condition in ecological-economic terms until ecosystems are stressed beyond repair, then surely we will be faced with overwhelming constraints and few opportunities.

The five ecological principles described in this chapter do not exhaust the economically relevant insights of ecology. They do begin to demonstrate just how far askew commoditization has taken the human economy. They also hint at the direction we need to take in order to bring the human enterprise in line with what we know about the way the world works. The following chapter discusses a general program of policies that might just do the job.

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chapter eight

Toward a coordinated decommodification strategy

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8.1 Introduction

This book has sought to demonstrate that over the course of centuries first the Western economy and then the global economy developed a structural bias in favor of commoditization. In spite of the material comforts and cultural benefits that commoditization has brought, it also has many profoundly negative consequences for humankind. These include the systematic impoverishment of the nonmarket aspects of social life, including the nurturing of families, communities, and other human relationships, and the care for the Earth. It is now time to consider some corrective actions that we can take. Before examining our options, however, it will be helpful to review the logic of the argument that has been made in these pages:

- The human economy and human societies are wholly dependent subsystems of the natural world and global ecological relationships.
- The material and energy used and harmful byproducts released by the economy are threatening to disrupt the natural world and seriously threaten the health and well-being of the Earth, many of its creatures, including humans, and the diversity of ecological systems that have evolved here.
- The solution to this crisis is to significantly reduce the impact of human economic activities on the Earth's environment.
- There are three ways to decrease the burden humans place on the Earth's ecosystems, the first two of which we would hope to avoid: (1) reduce the human population through mass death and shortened life spans; (2) reduce economic prospects, increase poverty, and eliminate the chance for prosperity for most of the world's people; or (3) reform the human economy so that it produces the prerequisites for a good life for all while limiting its physical impact to levels compatible with a healthy environment.
- The technology and social changes required to accomplish option 3 above are well understood but grossly underdeveloped.
- This underdevelopment is a direct result of commoditization, which operates as a systematic selection pressure favoring those goods and services with characteristics that make them most fit as commodities for exchange.
- Any selection pressure operating in a self-organized system such as the human economy acts over time to gradually expand the number of entities that carry preferred characteristics, thus crowding out and eliminating those entities that lack the preferred characteristics.
- The technology and social institutions necessary for sustainable development will promote goods and services with the following characteristics, which lack commodity potential:
 - They are customized to specific geographic, ecological, and cultural conditions.

- They require craftsmanship and stewardship grounded in deep knowledge of the specific conditions of end-use.
- They are built on relationships of caring, sharing, and collective effort among people.
- They are based on respect and understanding of the natural world and the principles of ecology and ecosystem dynamics.
- They are simple, thrifty, and efficient.
- They are built to last, to be easily repaired and upgraded or recycled into other goods or into the cycles of the earth.
- Since these characteristics are exactly those that are selected out by commoditization, if sustainable development is to be achieved, a decommunitization strategy of political intervention in the economy is essential to counteract the effects of commoditization.
- Public concerns about the state of the environment can be channeled toward economic reform if the public understands the ways in which the structure of the economic system presently undermines efforts to restore and protect environmental values and the possibilities for adjusting social rules and practices in ways that are consistent with ecological facts.
- The only way to limit market forces without diminishing freedom is if the capacity to regulate markets, raise resources for public use, and allocate public resources toward the common good is actively controlled by democratic institutions accountable to an engaged public.
- A "green" economy and a "green" democracy are best organized in a hierarchically nested series of democratically controlled jurisdictions that mirror the ecological organization of the planet.

Such dramatic political changes seem implausible, but they are realizable if we continue to raise the general public's awareness of the accelerating pace of environmental change and its causes, and if people continue to become aware of and experiment with alternative economic relationships. What is now a cause for concern among many people can then gradually become a powerful social movement that makes the desired changes possible, perhaps unavoidable. It is my position that without a fundamental change in direction, we will likely face an unthinkable future of mass impoverishment and suffering. We cannot afford to shut our eyes to the immensity of the problems we face, and there is no doubt, as the saying goes, that if we don't change direction we will end up where we're heading.

Human beings have an enormous capacity for action, creativity, and compassion. Although nothing can be predicted with certainty, we can be optimistic that as knowledge of both the problems and the solutions becomes widespread, we will begin to demand the economic and political changes needed for sustainable development. The most effective policies will be those that counteract the effects of commoditization and weaken its power over the direction of economic and social development. By focusing on commoditization, we can overcome one of the greatest obstacles to social change: the

feeling of being overwhelmed by our many, seemingly disparate problems. Because commoditization distorts economic and social relations in so many areas, addressing its rule over the economy as a whole would have a broad, positive impact on all aspects of economic and social relations.

8.2 The policy wedges

This final chapter is about the policies that are needed to decommoditize the economy, and the social movement required to create the conditions in which these policies can be adopted and implemented. The proposed policies taken together constitute a coherent program for building an economy that is responsive to environmental and social needs rather than simply the interests of those who benefit most from the commoditized economy.

Commoditization as a force shaping economic and social relations is a natural outcome of the release of creative energy for personal wealth production. As a result, there is continuous improvement in the quality and availability of commercial goods and services, which greatly enhances the quality of human life wherever it is free to operate. The point is not to destroy the incentives for commercialization and marketing of goods and services, the point is to create enough countervailing pressure to end the domination of commoditization over all spheres of social development. What is needed is an equivalent release of creative energy in the direction of building and conserving natural and social wealth.

"Ecological footprint" and other analyses show a fairly wide variation in the amount of environmental impact per unit of population, even among industrialized countries.¹ Similarly, the Genuine Progress Indicator shows that in the industrialized countries the expected correlation between increasing GDP and improved quality of life has broken down since at least the 1970s (see Figure 2.3). Much of the consumption in affluent societies is above that needed for a secure and healthy life. These data suggest that the hard link between economic growth and public welfare is exaggerated and that there is considerable room to develop the noncommodity sectors of society.

To accomplish this development two things are necessary but perhaps not sufficient: first the capacity and willingness of society to invest in public noncommodity services that improve the quality of family and community life without necessarily increasing production, and second, the responsiveness of government to needs other than those of commercial and industrial interests. In other words strong, effective, and broadly representative governance.²

The challenge is daunting to say the least. As we have seen, the economic bias for commodities is structural and systemic. That means that environmental and social policies intended to stimulate sustainable development, no matter how well-intentioned, usually fail to counter the underlying pressures of commoditization. Such efforts are overwhelmed by unsustainable economic forces. Yet by understanding the systemic nature of the bias for commodities, we can design a suite of policy initiatives which produce countervailing economic pressures to minimize the bias. If decommoditization

policies reinforce each other in a systemic way then they can become part of the economic structure within which producers and consumers make rational economic decisions. Such initiatives should have the effect of dramatically redirecting research, development, and investment toward the common good in a systemic, self-reinforcing way.

What we need are policies that improve quality of life without necessarily increasing the amount of energy and material throughput in the economy. There are three approaches, or policy wedges, that combined can reduce energy and material consumption while maintaining a high quality of life (Figure 8.1). These include

- **Improved efficiency** — getting more output per unit of input
- **Conservation** — conserving energy and materials whenever possible
- **Consumption-reduction strategies** — encouraging actions and behaviors that lead to voluntary simplicity and lower levels of individual consumption.

What about "the Am. Dream" (Gibson et al.)

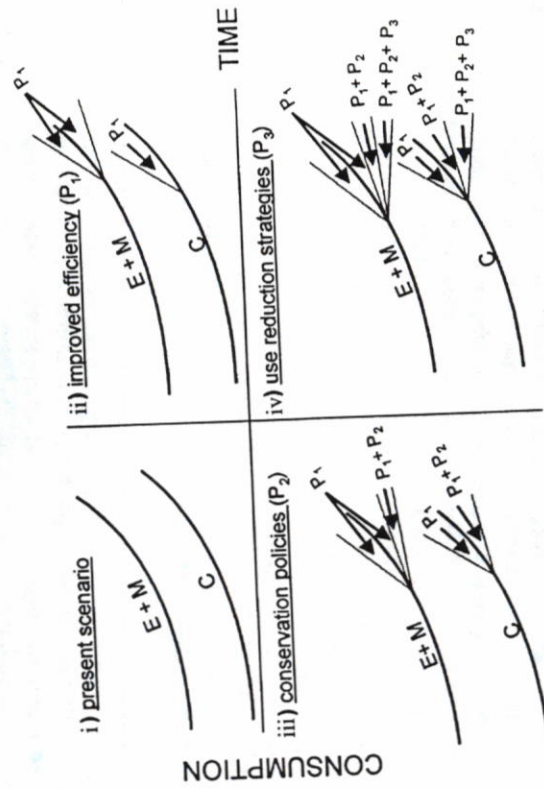


Figure 8.1 In the present scenario (i), increasing consumption (C) is tightly related to energy and material throughput (E + M) in the economy. (ii) In order to decrease throughput, economic activities must be made more energy- and material-efficient. Policies that stimulate improved efficiency alone can be expected to lead to lower prices and increased consumption, sometimes leading to increased throughput. (iii) Policies that encourage energy conservation (P₂), when combined with improved efficiency (P₁ + P₂) can begin to reduce consumption and E + M throughput. (iv) Further policies that encourage cooperation sharing and community provisioning (P₃) can be combined with efficiency and conservation to significantly reduce energy and material throughput while maintaining high quality of life.

Although there is considerable overlap between these strategies, in general efficiency focuses on technical improvements in the production process, conservation focuses on the improvements in use and consumption, and reduction strategies focus on individual and social changes that encourage simpler, more environmentally aware patterns of consumption and use. For example, consider the effort to reduce the amount of fuel used to heat a home. Efficiency gains might come from technical improvements in the heating system, conservation gains would be made by insulating the home or adding south-facing windows, consumption reduction gains would be made by turning down the heat.

8.3 The role of participatory democracy

The most effective defense that a society has against the continued spread of commoditization and the primacy of private over public interests is a healthy civic life. Civic life refers to the participation of individuals in the political and cultural life of their communities and nation. It refers especially to such participation that is aimed at promoting the general welfare — actions meant to help others and not just oneself. Efforts to promote civic life locate the source of power in a society where it belongs, with its citizens.

The participation of citizens in their own governance is a manifestly practical ambition — practical in that self-governance is fundamentally a process of solving problems together. The solutions to problems that communities face, from crime to the lack of open urban spaces, require the participation of citizens, and yet that participation is often inhibited by rigid bureaucracies and the influence of corporate interests. Politics in which citizens are kept apart — in which there are few local forums for citizens to discuss and act on current issues — leaves important decision making with those who already have political and economic power, and for whom continuing the present course of economic development is most beneficial. In order to give local citizens more power over decisions and policies that affect them, they must have economic power. They must be able to determine the fundamental character of their communities, finding a balance between commoditized economic growth and public welfare.

Governance capacity is the ability to translate the collective will of the people as it is expressed through the institutions of civic life into coordinated effective action. There is simply no way to counter the distortions of commoditization without including the full environmental and social costs into the prices of goods and services as well as implementing policies that effectively shape the economic context within which private investment and R&D decisions are made.

Most of the arguments for sustainable development, ecosystem and adaptive management, appropriate technology, and environmentally friendly changes come down to an argument for intervention into economic decision making — intervention informed by ecological understanding. There is no way to intervene into the aggregation of private economic

decisions collectively known as “the economy” without using the authority of government to act on behalf of the common good.

If we are going to expand the power and capacity of government, then we also must make government more accountable to an organized and active public, which is why the vitalization of civil society and democracy is so important. Without democratic institutions, increased governmental power becomes authoritarian. Authoritarian regimes are necessarily dependent on a ruling elite with centralized authority. The effect of authoritarian control over resources is similar to and more extreme even than the effects of commoditization. Authoritarian regimes thrive by intimidation and making citizens dependent on the central authority for their survival. Thus, the production and distribution of basic economic goods and services must be controlled by forces outside local communities.

Just as in a highly commoditized industrial economy, the goal of economic policy in authoritarian regimes is economic growth measured in GNP, because the wealth produced by such growth is readily transportable, centralizable, and assignable, and can be expropriated by the authorities whose power is thus enhanced. Noncommodity development in the forms of increased self-reliance, community and neighborhood empowerment, and collective capacity is as deeply threatening to authoritarian regimes (whether socialist or military) as it is irrelevant to capitalist-dominated industrial democracies. The collectivization, mechanization, and industrialization of agriculture under Stalin is a good example, as was the lack of attention to the environmental consequences of industrialization in the Soviet Union and Eastern Europe. A number of agricultural campaigns were launched under state socialism. These campaigns were centrally controlled, down to such details as when to sow seeds. Sowing had to be completed and reported to the authorities by a predetermined date regardless of local soil and climate conditions. Planting methods, such as whether to plant corn in rows or squares, were prescribed. The timing of grain harvest, cutting, and threshing were established by similar government dictates. The local indigenous knowledge of soil and climate was disregarded, and farming expertise soon atrophied.³ The only outcome that mattered was whether production quotas were achieved. This is how commoditization can result even without the commercialization pressures of a free market. On paper, Communist regimes had strict environmental laws. In the day-to-day management of industry, however, output was nearly the sole indicator of performance. The noncommodity value of pollution prevention could not compete with the commodity value of production. Because the state was both the owner and regulator, preference was given to the objectives of primary concern to the authorities, which was economic output and growth — in spite of the fact that the government's policies ultimately undermined the capacity for the growth it sought.

Free market and authoritarian economies each are skewed toward commoditization and all its attendant environmental and social distortions. State-controlled economies have the propensity to become tyrannical and to stifle

innovation and creativity and destroy local cultural diversity. Free market societies, while usually espousing the value of creativity and diversity, distort them by channeling them overwhelmingly toward commercial ends. What has often been presented as the only two political options — free-market capitalism or state-controlled socialism—each distort and limit human freedom and creativity and threaten the Earth.

If we are going to imagine and innovate our way out of the environmental crises of our times, we must be able to think beyond the confines of the false choices that are presented between two extremes. These dichotomies limit our thinking by presenting options that are equally unattractive. The choice is not between the tyranny of the market or tyranny of the state. Instead, there is an array of options for how humans can organize themselves and act collectively on behalf of the common good. The more we understand about the physical environment and the unintended consequences of our choices, the better chance we have of organizing our governments and our economies to minimize the negative effects of human activities. The choice, for example, is not between controlling nature or living passively as a victim of natural forces. Instead, there are countless ways to find a balance. The more we understand the forces of nature and the effects of human activities, the better we are able to make choices and remain flexible, capable of changing our choices as new information becomes available. Once again, as we have seen throughout this book, two extremes represent a false choice. The solution to the problems of commoditization is not to eliminate free markets but to use the collective human power expressed through government to alter the conditions and climate under which free markets operate.

We need effective democratic government that can intervene to deliberately and thoughtfully adjust economic system dynamics for the common good. One of the biggest obstacles is the way government itself becomes distorted by commoditization. As a result we are in a bind. We need government to counteract the commoditization effects of free markets, but government itself is affected by commoditization in ways that limit its effectiveness for acting on behalf of the public good. This is why the first step in addressing the environmental crisis must be the emergence of a powerful social movement able to extract government from its capture by the forces of economic power.

Such a movement could initiate the building blocks of new international, regional and subnational institutions with the capacity to effectively carry out policies at the local, national, regional, and global scales, and to encourage the expansion of civil society at all these levels.

The failure of modern societies to clearly identify the distorting effect of commoditization is a result in part of the institutional and ideological bias in which freedom is associated more closely with choice in the market than with self-government. Yet self-government is a primary democratic value, and economics should be subordinate to it. As important as markets are, it is time to rediscover the balance between market forces and politics wherein

political judgments can be made that reflect a concern with the common good. The common good is first and foremost to be found in the community — those aspects of life that are much less commoditizable because they involve substantive relationships among individuals and between individuals and their environment.

With the globalization of economic competition now taking place, the pressure to innovate has increased even further. It is to be expected that social uncertainty arising from insecure employment and rapid technological change coupled with steady global economic growth will further increase. Given the close association between economic growth, commoditization and ecological deterioration, the daunting challenge of reforming growth to minimize the negative effects on ecosystems must be faced right away.

8.4 The powers of government

Governments have six essential powers; they:

1. Create and support stable infrastructure for the provision of public goods and services, including the basic legal and organizational infrastructure of government itself.
2. Provide public goods and services.
3. Regulate activities, including commerce, that affect public welfare.
4. Collect taxes and expend public funds.
5. Protect human rights.
6. Provide for collective defense, public safety, and order.

These governmental powers, if used effectively as part of a coordinated decommoditization strategy, could counteract the effects of commoditization. But these powers themselves are subject to the forces of commoditization in the following ways:

1. **Government infrastructure** — There are two main aspects of the commoditization of public infrastructure:
 - In any given sector, infrastructure investments flow toward the most commoditizable options so that, for example, investments in building and maintaining roads and highways are far greater than investments in public transportation.
 - Elections are treated as a market exchange where candidates are sold to a public much like any other mass product.
2. **Public services** —
 - Whenever it is possible to profit from the provision of services, these services are commoditized and moved from the public to the private sector. As a result, private industry siphons off the simplest and most commoditizable tasks, leaving government with the most difficult and costly ones. As a result, governments always appear to be less efficient in delivering services than private industry.

- The pressures to reduce costs force governments to reduce labor costs through increasing labor productivity, with the result being the same commoditization substitution as in the larger economy: tools and products replace workers and relationships.
 - Public services are preconceived as being the provision of services for the smooth functioning of the private economy. Education is transformed into worker training, public health into the medical industry, etc. Over time, public education, public hospitals, welfare and other social services become increasingly commoditized.
3. *Regulation* — The primary role of regulation becomes to encourage commoditized economic growth by minimizing uncertainty and maintaining favorable economic conditions, allowing corporations to plan and operate in a predictable and secure environment that permits profits over the long run. Everything from local zoning laws to international trade agreements are designed with the intention of encouraging economic growth in terms of increasing the volume of commodities. Environmental regulations focus on the most commoditizable functions of pollution control and treatment rather than prevention.
 4. *Tax collection and public expenditures* — As a result of commoditization, governments gradually become major customers that pool the public's cash for use in purchasing goods and services.
 5. *Protection of human rights* — Human rights become subsumed into the rights of producers and consumers. The expenditure of money is protected as speech and given free reign. The rights of property are treated as more sacred than the rights of the person. (68 people affected)
 6. *Defense and public safety* — As in other areas we have discussed, prevention, in this case of war and violence, ought to be the goal. But because of commoditization, peace-making rarely receives the same amount of R&D attention as weaponry. Similarly, it is easier to spend public resources on policing rather than community building and crime prevention. In times and places where public services deteriorate, the first public service to be privatized by the wealthy is often the police function as the market for private security forces grows.

8.5 Steps in a decommunitization strategy

8.5.1 Getting private money out of politics

(As a result of the commoditization of governance, government becomes in substantial part an economic development agency whose success is measured by the ability to create and sustain conditions for economic growth. As we have shown, economic growth as typically measured is synonymous with commoditization. In the end, the effects of commoditization on government are to make government power itself a commodity that can be bought and sold by those wealthy enough to pay the price. Therefore, the

necessary first step in revitalizing government as a force for the common good is to get private money out of politics as much as possible through public financing of elections and public access to mass communication for political debate.

8.5.2 Supporting LCP public services

Next, we need an active public to insist that government invest in and maintain support for those aspects of public welfare that have the least commodity potential. Every sector of the economy has a group of people interested in defending the least commoditizable aspects of that sector. These include advocates and supporters of

- Environmental conservation and protection, including pollution prevention and the protection of biological diversity
- The protection of small farmers
- Organic agriculture, including farmers and consumers
- Alternative health care, including providers and users
- Public health and health maintenance
- Public transportation, including providers and users
- Crafts and farmers' markets
- Public education, including teachers and parents
- The rights and sovereignty of indigenous people
- Cultural and ethnic diversity
- Prevention of crime and violence
- Care for the young and old
- Elimination of racism and other oppression
- Worker health and safety
- Family values
- Community building
- Full employment
- And many similar causes

These causes are all linked by the fact that the success of their efforts requires collective action against the effects of commoditization. This fact creates the conditions for building powerful coalitions of caring composed of people who understand that part of the purpose of government is to act on behalf of the public interest and to provide those goods and services that people need but that private markets cannot deliver on their own unless they first distort and commoditize them. By linking these interests across sectors, it is possible to conceive of a broad social movement in support of democracy and public welfare that is powerful enough to build the institutions capable of countering the effects of commoditization. Religious and spiritual organizations and values may play a particularly important role here by insisting that nonmaterial and noncommodity values are ultimate and should take precedence over material values. The potential impact of

spiritually motivated social action can be seen in the movement towards "voluntary simplicity"⁴ or what might be called the **decommodification of everyday life**. Spiritual values have been the foundation for many of the most important social movements of our time.

8.6 Government reforms for decommodification

How should the six essential purposes of government change in order to offset the effects of commoditization? We will consider each one separately, although the functions clearly overlap. Commoditization's power as a selection process operates because of the **natural tendency** for investment of capital and other resources to flow toward that which can be most readily commercialized. Over time the imbalance favoring commodities grows. Government's power to build, regulate, tax, and spend can provide powerful counterbalance by shifting investment and other resources toward the underdeveloped noncommodifiable sectors of the economy, the economy of caring, the capacity for local self-reliance, the protection of ecosystem integrity, and the provision of the full range of noncommodity goods and services that cannot be expected to be provided by private industry.

Such a coordinated decommodification strategy requires first and foremost a revisioning and revitalization of governance as the manifestation and agency of the collective interest in promoting the common good. An understanding of commoditization provides a common conceptual framework with which to design and implement public policies. **The intent of decommodification policies should always be to accomplish what private industry cannot accomplish and to regulate industries and markets to minimize the effects of commoditization on the environment and society.** Thus, infrastructure development should focus on building up what private investments tend to ignore and commoditization tends to undermine. Once this becomes clear, the role of government grows more apparent, particularly in supporting low commodity potential research and development and stimulating improvements in the economy of caring and relationship, and in dramatic meet basic needs and build prosperous communities. **These should be the three pillars of governance and public service: knowledge, care, and thrift.** These should be the themes of all our reforms. First, some thoughts about how the government role in human rights and public safety would be affected by a decommodification strategy.

8.6.1 Protecting human rights

The concept of what constitutes a human right would include the **basic economic rights** referred to in the International Covenant on Economic, Social and Cultural Rights.⁵ **It would also include rights to a healthy environment and the rights of local communities and indigenous peoples to control local commons, biological resources, and cultural destiny.**

8.6.2 Defense and public safety

More effort would go into the low commodity potential services of community and neighborhood watch programs, family support, crime and violence prevention programs, conflict resolution, and others.

Although government's role in providing for public safety and protecting human rights is extremely important, the remainder of this chapter will focus mostly on the infrastructure, regulation, and taxing and spending functions of government.

8.6.3 Government infrastructure for the provision of public goods

Investments in infrastructure would be heavily weighted toward energy and material conservation, local community and bioregional support structures, environmental protection, and the institutions of caring and connection.

A key component of any sustainable development strategy is industrial policy designed to move industry in the direction of dematerialization, or the use and consumption of significantly less material and energy per unit of production. Many have argued for such a new industrial policy,⁶ some calling it a new industrial revolution.⁷ Although the importance of inventing new ways to get more out of less materials and energy cannot be overemphasized, if it is done without attacking the structural problem of commoditization it will not succeed. Unless the goal is shifted from improved efficiency (the most product with the least input) to improved sufficiency⁸ (the most satisfaction from the least product), then dematerialization can never become decommodification. Nevertheless, a new industrial policy is a critical aspect of the needed economic reforms. The components of such an industrial policy would be as follows:

- A major public investment in research and development of clean technology and the substitution of safe, abundant, renewable resources for hazardous and nonrenewable resources in all areas, especially in the energy industry.
- Major tax incentives and subsidies toward the development of zero emissions and integrated closed loop processes.
- Requirements that all products be designed for easy disassembly and reuse, including buildings.
- Strict energy efficiency requirements for all consumer end-products.
- Adjustments to current Best Available Technology rules to specifically promote the use of zero emissions technologies.
- Major new investments in rail service and other new low-impact transportation.
- Conversion of durable goods into services by shifting from retailing to leasing services for most major and even minor consumer goods and appliances.⁹

- The development of the physical services industries, particularly repair, restoration, cleaning and maintenance services, redesign and recycling services, and a range of other labor-intensive, hands-on services in conjunction with the new leasing industry.
- Major shift of public investment toward human services and social welfare.
- Establishment and maintenance of major bioregional research and development centers focused on LCP innovations in all areas, especially in appropriate technology, low-impact agriculture, energy and materials conservation, land use, urban community design and development, pollution prevention, and including education and extension programs to help individuals and communities gain greater levels of self-sufficiency in meeting basic needs.
- Expansion of the institutions of locally owned public utilities, employee stock ownership programs, and other means of democratizing capital.¹⁰

8.6.4 Provision of public goods and services

The only way to balance commoditization is for all those goods and services that are difficult or impossible to market profitably but are essential for maintaining quality of life in our communities to be provided by or subsidized by the community in some way. A successful decommoditization and sustainable development strategy depends on being able to shift time, attention, and money to the valuable goods and services that have low commodity potential. This will most likely occur in the public sector.

Most modern economies grow in large part through labor productivity improvements. But economies will only benefit from these labor-saving innovations in the long run if there are other opportunities to reemploy the newly redundant labor. In a commoditized economy, labor shifts to new or expanded jobs in the production of new commodities, which in turn expands the amount of energy and materials flowing in the economy; in other words, leads to economic growth. If, however, a growing portion of workers displaced by labor productivity improvements is shifted through public investment into the low commodity sectors of the economy of caring and relationship, then the freed labor will be valuably employed for the long term without necessarily increasing the flow of energy and materials.

Even without a deliberate effort to shift workers to public employment, in every growing economy the public sector expands as a proportion of GNP, even under the pressures of commoditization and without any real increase in the amount of attention, time, and resources allocated to the noncommodity public services. It is important to understand why the public sector paradoxically grows under commoditization. This has to do with the pressure on wages of increases in private sector labor productivity. When industries lower costs through labor-saving innovations they become more profitable. The workers that remain, although reduced in numbers, can

command higher wages. In general, public sector workers, through their labor organizations, attempt to keep pace with private wage scales. However, public employees are generally in the lower-commodity services sectors (or they would not be public employees) and cannot increase their productivity to the same degree as is possible in the private sector. As a result of this natural process, there is an increase in the proportion of wealth allocated to the public sector. In the same way, most public sector employees do not produce goods and services that are counted as part of GNP, and therefore the public sector expenditures as a portion of GNP also increases.

A decommoditization strategy would increase public sector expenditures as a proportion of GNP considerably more. Such an outcome can only happen through the collective expression of nonmarket values through politics and government, not through markets. Markets can and must be enlisted to allocate resources efficiently among alternative commodities, but the survival of nonmarket goods and services in the economy of caring and relationship depends on the capacity of public institutions to carve out economic niches where these goods and services can flourish. As politically difficult as it may presently appear to be, sustainability and the health of the planet depends on government — big government for big problems, small government for small ones. The issue of democracy, fairness, and public accountability become, therefore, the most urgent of the sustainable development issues.

If strong, effective government is necessary, then it must also be competent, fair, and responsive. Thus, the movement for environmental sustainability must be a movement for good government, strong government, and the public capacity to balance commoditization with the collective provision of important public goods and services. In this need lies a potentially powerful alliance between advocates for environmental protection, good government, and public service unions and professional associations. The potential social movements to reclaim governance and the capacity to act on behalf of the environment are discussed at the end of this chapter.

8.6.5 Government regulations for environmental protection, commerce, trade, and land use

The modern regulatory apparatus in industrialized nations is usually justified on the basis that it promotes the common good in cases where free markets fail to do so on their own. For instance, health insurance companies would prefer to insure only people at low risk of illness, but the state regulates insurers to some extent to make certain that the risk and cost of health insurance is spread more evenly throughout society. The common good comes at the expense of some percentage of profits that insurers must forgo. Insurers benefit in the end by the increased stability accorded to the insurance market from the reduction of the numbers of uninsured. In theory, government regulation should only be objectionable when it interferes with markets that would more effectively serve the common good if left to themselves.

The question then is not whether to regulate certain industries but how to regulate them. Commoditization operates to favor certain kinds of regulation, those that resist commoditization the least. First, regulations are deliberately designed to have the least negative impact on economic growth and in the case of commerce regulations are designed specifically to encourage economic growth. As we have seen, encouraging economic growth in a commoditized economy necessarily intensifies the force of commoditization. Furthermore, government, as much as consumers, is subject to the preference for commodities when selecting solutions to any particular need. It is simpler to buy something than to do something, especially when you are surrounded by people eager to sell.

It is also simpler to regulate in a piecemeal fashion rather than to have a coordinated strategy. This is as true for environmental regulation as any other kind. Air quality statutes are passed in response to air pollution, water quality statutes in response to water pollution, and so forth. There is no overall, aggregated measure of environmental quality, and there is no holistic policy of reducing effects of human activity on the biosphere. The establishment of the regulatory regime in most industrialized nations in the 1970s took this approach and subsequently created a huge pollution control industry. Industries took the easiest, most commoditized solution by purchasing add-on commodities in the form of pollution control devices that brought them into compliance with discharge regulations. Pollution control technologies do indeed reduce the emissions of regulated pollutants into air and water, but environmental quality may still suffer long-term damage because filters and other emission control technologies merely move pollutants from one medium to another (e.g., from the air to the soil when filters are disposed of), and because the production, maintenance, and disposal of pollution control devices often lead to *increases* in total energy and material use. Meanwhile the devices allow polluting industries to continue to expand while reducing the worst of the localized and visible pollution in the wealthy industrialized world. Pollution has also been exported, as the dirtiest industries are relocated to the poor, newly industrializing parts of the world.

One alternative to piecemeal pollution control would be a coordinated strategy of waste reduction and pollution prevention for each major economic sector aimed at decreasing the total amount of energy, raw materials, and pollution produced in each sector and the economy as a whole. A regulatory regime to accomplish this would necessarily be quite demanding, requiring polluters to redesign production, distribution, and waste disposal systems while at the same time using the government's powers to tax and spend to discourage consumption of products with high material and energy costs.

Environmental regulations will be much more effective when accompanied by regulatory reforms in other areas that encourage the commoditization of the economy. Most estimates conclude that in order to reduce the human impact on the environment while continuing to grow economically, we must become four to ten times more productive in our use of physical

materials and fuels.¹¹ Although this may be a difficult technological challenge, it is instructive to note that modern industrial technology and commoditization have increased the productivity of labor by more than 100-fold during the period of industrialization. Each hour of human labor can produce more than 100 times more economic goods and services than the same hour could 100 years ago.¹² Decommoditization policies that shift the incentives for investments toward materials and energy productivity can stimulate similar productivity gains for these inputs.

Improvements in energy and materials efficiency alone will not, however, lead to general decommoditization. Every savings in energy and fuels represents cash not spent. If that cash is simply shifted to purchasing other commodities, then no matter how energy- and materials-efficient our economy becomes, overall use and consumption of energy and materials is likely to continue to rise. This is clearly demonstrated in the economic modeling done by Faye Duchin, who demonstrated that, given current projections in economic and population growth, even assuming a scenario in which both the industrialized world and the less industrialized poor nations adopt the most clean and efficient technologies available today and conserve energy and recycle raw materials at the levels achieved by only a few countries at present, "despite substantial savings in energy and materials that are attributable to the new technologies... the pollutants that are tracked in the model all continue to grow, rather than fall, over the period studied."¹³

Policies directed to promoting efficiency improvements must be accompanied, therefore, by decommoditization policies that actually slow economic growth while increasing public welfare. This can only occur if the money generated by reduced costs goes in two directions: (1) toward increasing capital accumulation through an increased savings rate, and (2) the investment of that capital toward improving public welfare through investments in supporting local self-reliance, building the infrastructure of caring and connection, and protecting ecological integrity. Success will require reforms in the rules governing corporate practice, public and private credit and investment, and the allocation of government revenues. Obviously this cannot be accomplished by current environmental regulatory agencies alone. The only way for a green economy to emerge is for ecological principles and the reforms they imply to permeate all levels of government and policy, including governance institutions at the global and ecosystem levels which do not presently exist.

Land use decisions have enormous environmental consequences. The problems associated with attempts to steer land-use toward more sustainable, environmentally friendly patterns raises many of the same sorts of issues of government regulatory capacity. Most land use regulations, zoning, and land development policies have some decommoditizing effect on property — one's property rights are necessarily constrained by them to some extent. This is particularly true in cases where communities attempt to regulate and control suburban growth or constrain and direct urban growth to patterns meant to best serve goals such as transportation efficiency or

clustering of public works services. Some communities have established urban growth boundaries beyond which housing and commercial development are not allowed. The stricter the land use policies, the more they come into conflict with commoditization. This offers another potential link in the building of political alliances against the harmful effects of commoditization, particularly between advocates for the revitalization of inner-city neighborhoods, promoters of public transportation, and protectors of green space and wild areas from the effects of suburban sprawl.

8.6.5.1 Trade

Trade policy is invariably put to the service of the globalization of commoditization, and the force of commoditization in turn stimulates more and more international trade in a global marketplace. Commoditization is exactly the preference for things that can function well in a free-trade environment. Free trade and commoditization feed each other. The argument for free trade rests on the logic of comparative advantage: if a country exports those goods it can produce most efficiently because of its particular endowments of natural resources and the skills of its people and then imports the things it needs that it is less able to produce efficiently, then the net result will be increased efficiency and therefore increased wealth for everyone. The advantage to local consumers is the greatly increased availability of goods and services for purchase and decreased prices resulting from increased competition. In the current trade climate, all nations are encouraged and, in many cases, compelled to open their domestic markets to imports and to produce more for export to earn foreign currencies so they can participate even more in the global markets.

The logic is impeccable, but it does run into some predictable problems. For example, as developing countries around the world all increase exports, particularly of primary materials, prices drop, undercutting many of the benefits derived originally from their comparative advantage in primary commodities. Those who gain from this situation are the wealthy consumers who benefit from falling prices and the investors and manufacturers of consumer goods who gain the windfall both from falling prices of raw materials and the freed up consumer cash in the rich countries that results from lower consumer prices.

The problem with the logic of comparative advantage is that it accepts as a given both the accidental inequalities of geography and the deliberate injustices of history. It also assumes that all nations interact with a free market from an equally competitive bargaining position, eager to exchange their most efficiently produced goods with the rest of the world. Many nations' and peoples' competitive advantage derives from their position of weakness. They are poor and able to work for lower wages; therefore, low labor costs are their comparative advantage. They have raw materials but not the capacity to process them into useful goods. Thus, the export of primary materials is their comparative advantage. But the status of workers and the lack of local industry is as much or more a result of colonialism and the history of

oppression as it is that of geography and cultural development. This means that people are asked to compete in a situation where the misery of their own oppression is exactly what they have to sell.¹⁴

The logic of comparative advantage also leads invariably to specializing in those export commodities for which a nation has some perceived advantage. This specialization, as it intensifies, necessarily reduces local economic diversity. With loss of diversity comes increased vulnerability to competition, fewer options, and lower resilience in times of economic stress. As in every other area we have discussed in this book, the challenge is to maintain the balance between the pressures of commoditization and other noncommodity values.

The globalization of commoditization and accompanying concentration of capital in the hands of transnational corporations leads to increasing marginalization of the majority of the world's people who have little or nothing to contribute to the cash economy. As commoditization shapes the global economy and absorbs resources, more and more of available human time, attention, and natural resources are shifted toward satisfying the consumer demands of those who can pay. The gap between the rich and poor will grow ever wider unless the forces of commoditization are counteracted. The United Nations Human Development Program reports that in 1998 the richest 225 individuals had as much wealth as the total income of the world's poorest two and half billion people.¹⁵

Gaining some social control over the flow of international trade and investment is necessary and will require new global institutions with substantial authority to regulate international commerce to protect the public interest. Nations are increasingly unable to control or even influence the direction and content of global commerce.¹⁶ Small communities and neighborhoods are even more disadvantaged. Seeing that renewed investment in local communities and appropriate technology will be necessary to make the transition to a sustainable economy, and that these tend to have low commodity potential, the conflict between the interests of sustainability and free trade will only grow stronger. At some point in the expansion of the global economy the need will emerge to counterbalance the forces of commoditization at the global level. As the institutions of the global economy are built, global institutions must also emerge to protect the common good. There is no way around the counterintuitive fact that the empowerment of local communities and the decommoditization of the economy necessarily require new and powerful authority placed in global trade institutions that are democratically accountable to the peoples of the world.

At present all the trends of trade and investment are in exactly the opposite direction. There is much less public than private investment in the so-called emerging markets. The amount of private capital flowing into these markets rose from \$44 billion at the beginning of the decade to an all-time high of \$244 billion in 1996 (in current dollars). At the same time, publicly funded spending, or "official development assistance," fell by more than 25%. In 1990 less than half of the international capital moving into the Third

World came from private sources; by 1996 this share had risen to 86%. These types of funds, particularly under the conditions of commoditized capital flows (meaning mobile and speculative), are highly vulnerable to mood swings and sudden changes of fortune. This was demonstrated in 1997, with the onset of the global economic crisis in Asia, when the trend reversed and private capital flows to emerging markets fell by around 20%.¹⁷

The volatility of capital flows in the late 1990s initiated a period of severe economic uncertainty for most developing countries. This economic uncertainty strictly limits the capacity of government to protect natural resources and the environment. Globalization of economic development and investment makes it nearly impossible for weak governments and underdeveloped economies to act alone to protect their economies from capital flight and currency speculation. The economic strain places tremendous stress on national governments to initiate or continue rapid, unsustainable development by accelerating the exploitation of natural resources as the only hope of offering investors the potential for quick fortunes, and thereby attracting foreign capital investment. The resulting impact on the environment has been devastating. Since no individual government is now capable of effectively controlling capital movements, the only hope is through internationally negotiated capital controls associated with international trade agreements.

Investment in less developed and less commoditized countries takes three forms: (1) **foreign direct investment**, in which foreign capital is invested in the productive capacity of a country — often this is done in joint partnerships between the foreign investor and a domestic partner; (2) **portfolio investments**, in which foreign investors buy stocks and bonds issued by domestic markets; and (3) **loans from foreign commercial banks**, either to local or foreign investors for use in the domestic economy. Each of these has grown much more mobile and volatile at the same time that the availability of official, government-to-government economic assistance has declined. The result is the dwarfing of publicly financed international development assistance by private investment and the resulting intensification of commoditization. **It might be possible to counterbalance this by**

- Establishing international controls over capital mobility through international agreements.
- Levying an international tax on capital movements and currency exchange to provide resources for the creation of international institutions for market regulation, environmental protection, and labor and other social standards.¹⁸
- Requiring that all trade agreements be accompanied by civil charters covering environmental protection, workers' rights and safety, food safety, human rights, and other common goods neglected because of commoditization.
- Supporting local and regional self-reliance and reduced dependence on the global economy.

- Reforming trade agreements to control capital movements, and applying tariffs and duties which encourage optimum local self-sufficiency in food and energy and the protection of natural resources and the environment.

8.6.5.2 Environmental protection

The body of laws and regulations that presently govern the activities of business, industry, local communities, nonprofit organizations, and individuals has over time been distorted in the direction of commoditization. New rules and regulations are needed to counteract this distortion and to create the conditions under which the natural world is protected without sacrificing prosperity. This is the heart of the challenge of sustainable development. In general **these regulations would increase the role of government in economic regulation and would increase employment in conservation and preservation. They would force producers to design products that are energy and materials efficient. Such initiatives and reforms might include a shift in the principle underlying environmental protection regulations from pollution control and reduction to pollution prevention and elimination.** This will require

- Gradually declining allocation of total maximum wasteloads in a given watershed or airshed, with concomitant public capacity to monitor releases and require necessary reductions.
- Requirement that all major manufacturers develop and implement both site-based and industry-wide energy and material reduction plans.
- Redesign of production processes so that all waste, including waste energy, is captured and used.
- Requirements for manufacturers to take back their products for reuse or recycling, in effect requiring expansion of leasing arrangements for most major purchases.
- Institutions and incentives for the exchanges of discharge rights and waste materials operating under rationing systems, with strict caps on overall pollution.
- A permitting system for all new synthetic chemicals and materials with permits allowed only after clear demonstration of absence of environmental harm.
- Government capacity to regulate by classes of compounds or types of processes that are reasonably anticipated to have negative environmental consequences.
- Regulatory structure guided by sustainable development principles, using cost/benefit analyses that include the nonmarket value of social and environmental goods and services.
- Meaningful environmental assessments incorporated into the regular functioning of all government agencies including the permitting functions associated with all major private investments. These will be based on broadly defined costs and benefits, including nonmarket ones.

8.6.5.3 Corporate influence

Corporate power and influence naturally grow along with commoditization in a classic positive feedback effect. Corporate power is used to promote policies that spur commoditized economic growth. As these policies cause the economy to become more and more distorted toward commoditization, corporate power grows even more. The more corporate power grows the more corporations influence public policies at all levels toward the encouragement of commoditization, and so on.

In the most recent historic period this has been most noticeable in economic globalization. Major transnational corporations have used their influence to convince nations to lower barriers to investments, reduce or eliminate regulations on taking profits out of countries, and have encouraged nations and regions to compete with each other to lower corporate tax rates and increase publicly supported incentive packages designed to attract foreign investment. Speculative investors have achieved the elimination of fixed exchange rates and removed most barriers to the movement of currencies across borders. The whole process has been facilitated by the increasing commoditization of finance and information through the computerization of information and financial transfers among banks, stock markets, and commodity markets. While the infrastructure of the global economy has matured and come under effective control of transnational corporations, the institutions of international civil society and governance capable of regulating corporate behavior for the common good have matured slowly, if at all.

Amid the antigovernment rhetoric of much modern political ideology, it's easy to forget that the private corporation is an artifact of governance. The history of corporate law is readily understood in terms of the logic of commoditization. The whole point of corporate law is to create conditions conducive to amassing capital and establishing commercial organizations. The existence of corporations and the body of corporate law is a public good created by collective action. Therefore, collective action, through the exercise of governance, can and should be applied to reigning in the power of corporations. No strategy for sustainable development or correction of the economic distortions caused by commoditization can possibly succeed without doing so. The following policy directions would begin to check the continuing growth of corporate power:

- Reform of all government agencies to prevent capture by industry. This would include the following:
 - Hiring preferences given to individuals from outside the regulated industries and particularly to those with backgrounds in the public or nonprofit sector (greatly expanded as a result of this overall reform package).
 - Establishment of sustainable development policy goals in the areas of increased materials and energy efficiency in the context of rationed

total use, increased employment, and reduced waste for every agency including military, transportation, commerce, housing, etc.

- Preferential treatment for small and local business in all government services.

- Reform of corporate law to weaken the power of corporations by reviving the notion of corporate charters as privileges issued on behalf of the people by their representatives.

- Requiring periodic review of charters, with the possibility of revocation for irresponsible corporate behavior.
- Limiting the legal fiction of personhood which grants corporations the same civil rights as individuals while at the same time granting limited legal liabilities that would never be given to individuals.

8.6.5.4 Economic development and modernization

The history of economic development and modernization has been deeply distorted by commoditization. Those aspects of development and modernization that served commoditization received abundant investments of time, human attention, and resources, and those aspects meant to build the capacity for delivering public services and support the noncommodifiable requisites of a good life grew increasingly underdeveloped in comparison. The problems associated with this distortion of development are easy to observe even if difficult to control. These problems grow more or less severe depending on the state of economic development in any given time or place.

The problems lead to periodic reevaluations of economic development strategy and calls for reform. The most recent reform movement has gathered around the critique that describes conventional economic development practices as *unsustainable* because its unintended consequences damage the environment and weaken local community stability and resilience. In response a movement for *sustainable* development has emerged. As our analysis shows, the recent crisis of development is an outcome of the process of commoditization and cannot be mended without a deliberate strategy of balanced development.

This type of development has sometimes been linked to "mid-range" technologies in the development literature to distinguish them from both the high-cost, large-scale, capital-intense mega-projects and low-tech, labor-intense subsistence tools available in underdeveloped economies. What are called mid-range technologies are consistent with what I have described as technologies with mid-range commodity potential. They are also consistent with the types of technology that have emerged from the appropriate technology movement. Many international development agencies and major philanthropic foundations have recognized the need for balanced social, economic, and political development. Over the years many critiques of international development policies have been leveled, and the development community has entertained many versions of the call for reform, most recently in the guise of sustainable development. In the present era, with the private flows of capital and investment now far outweighing that provided by international development agencies, the need to counterbalance the forces of commoditization is greater than

ever. The currently most powerful institutions for global economic development — the World Bank, International Monetary Fund, and the World Trade Organization — are all committed to a strategy of increased commoditization. The policy formulas and so-called structural adjustments that developing countries are being pressured to adopt are for the most part the exact opposite of a decommoditization strategy. Governments are pressured to open their doors to free movement of capital, to lower domestic taxes, and greatly reduce public spending on welfare and social services. The objective is to shift money and resources to the most commoditized sectors of the economy in order to stimulate economic growth in terms of commercial goods and services. This is done partly to raise the funds needed to pay debts to the world's major lenders, further concentrating wealth and power in the hands of the wealthy and further stimulating commoditization in the classic positive feedback process.

The entire institutional structure of global economic development must be reformed in order to gain some control over this runaway commoditization feedback mechanism. An international sustainable development infrastructure is required beginning with a commitment from the major international development agencies to support a network of well-funded bioregional research and economic development centers specifically devoted to local sustainability, the development of diverse, self-reliant economies based on local ecosystem characteristics, local renewable resources, local crafts industries, urban-rural economic linkages such as community-supported agriculture and urban gardening, renewable energy and public transportation. Such an infrastructure could be funded by taxes and fees on currency exchanges and other international trade as well as on global taxes on carbon emissions and the trade of carbon emission rights.

8.6.6 Taxation, public spending, and the supply of money

Government's ability to raise revenues and to spend those revenues gives government the capacity to shape the economy. Because taxes can shift the allocation of resources in an economy, a government's authority to tax and spend may be the most important power in terms of reinforcing or counteracting commoditization. Taxes and public spending also have an effect on the availability and cost of private credit. Credit plays a major role in commoditization, especially in its acceleration in advanced industrialized societies. These issues are discussed below.

8.6.6.1 Tax policies

Tax policy should be used to counteract the effects of commoditization.¹⁹ The aim of a strategy to correct the distortions of commoditization would be to decrease the effective price of labor and increase the price of raw materials and energy by gradually shifting taxes away from wages and income and onto materials and energy. Tax policy may be the most important and efficient tool for counterbalancing commoditization, because it directly

influences prices and makes it possible to shift money from the most commoditized sectors to the least. Such taxes could create incentives for producers to reduce the material and energy content of their products, thereby reducing the environmental impacts of production. Taxes could also be targeted to the key elements of commoditization such as packaging, advertising, international trade, capital gains, and currency exchange. The revenues collected from such taxes could be used for targeted public investments in further production efficiencies and community-building.

Raising the price of energy by imposing energy taxes would probably be the most efficient and effective means of decommoditization. It could accomplish much environmental good by itself and be relatively simple to administer if not to legislate. Energy taxes could be made more sophisticated and be targeted for particular environmental purposes, such as a tax on carbon content to reduce the emissions of CO₂. Such taxes would encourage the shift from fuels with the most carbon, coal, toward natural gas and ultimately to carbon-free hydrogen fuel.

Shifting the tax burden from labor (in the form of income and payroll taxes) to energy and materials (in the form of raw material and fuel taxes) would lower the effective cost of labor in comparison to energy.²⁰ Human labor is the least commoditizable of the factors of production, and commoditization always moves in the direction of increasing labor productivity through substitution of energy and energy-intensive capital for labor. Raising the price of energy through fuel taxes and simultaneously reducing the price of labor through lowered income and payroll taxes shifts the potential gains from productivity improvements from labor to energy and materials, thereby moderating one of the most potent stimulants for commoditization. With labor costs declining in relation to energy and raw materials, it begins to make sense to repair rather than replace consumer goods. Retrofitting and insulating homes becomes less expensive than paying for fuel for heat. Labor-intensive organic farming practices begin to compete with energy-intensive, high-input agriculture. Locally hand-made crafts begin to compete with imported Barbie dolls.

In addition to taxing materials and energy, it may be possible to deliberately tax pollution. Taxes could be levied on air, water, and soil pollution of all kinds, with the most toxic and damaging pollutants being taxed the most. Taxing pollution output is another way of internalizing costs of production that are usually externalized to society. Such environmental taxes are already in use in countries around the world, and their popularity is expected to rise as the costs of pollution are better understood.²¹

In the end it makes sense (as it has for such "sin" taxes as the levy on alcohol, tobacco, and gambling) to tax things we would like to reduce so that the effect of higher prices can have social benefits. When taxes are used in this way, they are sometimes referred to as "regulatory" taxes. Regulatory taxes work best when levied against activities that are elastic; in other words, people are able and willing to change behavior in order to avoid the tax. It makes sense therefore to accompany regulatory taxes

with incentive programs and infrastructure development to encourage the desired behavior. Energy and materials taxes will work best in conjunction with an industrial policy that encourages efficiency and a public investment and social welfare program that promotes sustainable development education and alternatives. This will make it possible for people and industries to avoid the tax by shifting the types of goods produced and production processes used. Of course, a government that relies too heavily on regulatory or "sin" taxes runs the risk of being in a serious conflict with itself over reducing those activities and thereby reducing government income. Regulatory taxation must always be balanced with strictly revenue-generating taxes such as sales taxes and taxes on various forms of income and property.

Consumption taxes are an alternative or corollary approach to energy and raw materials taxes. Of these, the value-added tax may be the most powerful. A value-added tax would impose a tax at each stage in a product's manufacturing life at which value is added to it. This would have the effect of raising the cost of the product and thus inhibiting consumption. Unlike the sales tax, which simply adds a fixed percentage to the cost of buying products, the value-added tax imposes greater costs on highly commoditized goods. In other words, a product that is highly processed — i.e., that undergoes many stages of added value — is taxed more than a product that is only minimally processed. So instead of just discouraging consumption by raising prices, value-added taxation could encourage some substitution away from highly commoditized goods and services.

One objection to the value-added tax is that it unfairly burdens the poor, who must consume most or all of their income, as against the rich, who consume only a small part of their income and would consequently receive a huge tax cut from the reduction of income taxes with no concurrent imposition of another tax. In other words, using value-added taxation instead of income taxation would shift the tax burden from the rich to the middle and lower classes. Consequently, some income tax should remain in place, especially on investments. Moreover, it would be necessary to provide a tax credit or refund to the poorest citizens so that they do not pay a disproportionate share of taxes. Finding an equitable mix of income, value-added, and pollution taxes as well as tax credits and refunds for the poor is an achievable task.

Other proposed tax policies include the following:

- Accelerated depreciation allowances for old energy-inefficient plants and equipment to encourage energy-efficient replacements.
- Employment tax credits and elimination of local "head taxes" (per employee taxes often levied on businesses by local governments).
- Tax incentives for emissions reductions, recycling, and other environmentally beneficial private initiatives.
- Tax credits for worker training in the new skills needed by an energy efficient economy.

8.6.6.2 Expenditure policies — subsidies and government purchases Tax policies, although necessary, are not sufficient to encourage a balanced economy. How tax revenues are spent has an even greater potential to either increase the distortions of commoditization or help to balance them.

If goods and services with high value and low commodity potential are going to have any chance of economic survival, then some methods have to be devised to transform their high social value into actual support, financial and otherwise. This is the very essence of subsidies, where government provides resources to correct the negative side-effects and distortions created by free markets. If a government acts primarily to promote the policies of economic growth, then government purchases and subsidies will further serve the cause of commoditization rather than correcting the distortions of commoditization. This problem becomes extreme when powerful economic interests so capture government that its policies no longer serve to balance the distortions and correct the externalities of free markets, but instead aggravate the distortions by subsidizing the already privileged. In his book, *Paying the Piper: Subsidies, Politics and the Environment*, David Roodman describes the economic distortions and environmental damage created by such subsidies.

Governments around the world spend upward of \$500 billion on subsidies for agriculture, forestry, mining, and many other industries, affecting the economics of these industries and their environmental costs. These types of subsidies make commodities out of natural resources that would otherwise be too costly to commoditize through the workings of the free market. They intensify rather than correct the effects of commoditization. The U.S. government currently favors the fossil fuel industry with about \$36 billion per year of subsidies, which have the effect of keeping fuel prices low and encouraging wasteful energy use by Americans.²² Estimates vary, but if fuel prices in the U.S. were based on the real cost of production, a gallon would cost about \$2.50 (\$0.70 per liter). If the cost of air pollution, highway construction, traffic management, and other publicly funded transportation-related expenses were also added in, the real cost would come out at around U.S. \$4.50/gallon.²³ Even without the imposition of the energy taxes discussed above, these prices would begin to shift the economic calculations of investment decision toward energy efficiency.

Even when subsidies are instituted for ostensibly good reasons, their unintended consequences can be very damaging. For instance, agricultural subsidies are intended to protect farmers from market instability, ensure an agricultural base to protect a nation against dependence on food imports, and to provide a predictable food supply with stable prices. In practice, however, the largest share of agricultural subsidies go to the minority of large farms that produce the majority of the food.²⁴ The losers in this arrangement have been small to mid-sized farmers, who cannot compete with their oversubsidized, oversized neighbors. The subsidies encourage ever-expanding monocultural production, because companies and farmers know the government will buy their products. As a result, more acres are put under the plough, with the concomitant destruction of habitat and pollution of soil and water from agricultural chemicals.

What needs to be subsidized are exactly those goods and services we have discussed throughout this book, the systems of health promotion and illness prevention, of ecological health and integrity, of local community self-reliance, of the economy of care and connection. Because they resist commoditization, they cannot survive without subsidies derived from the collective resources of people, either through government or through voluntary associations and civil society groups.

There are several ways for governments to provide resources for desired social and environmental purposes and each has a different commoditization potential:

- The direct provision of these goods and services, where appropriate, has the most potential for decommoditization by reallocating society's resources directly from the tax-paying commercial sector to public goods and services for which markets rarely exist.
- Government can also choose to allocate revenues to the private sector, but with the intention of supporting particular kinds of business, such as small organic farms, neighborhood service providers, housing co-ops, etc. In the U.S. the Small Business Administration was created to serve a particular clientele in this way. By supporting small private providers of LCP goods and services, government limits the amount of direct service it provides while still serving the purpose of decommoditization and increased employment.
- Government can choose to allocate its resources to support large and powerful corporations in the hopes of stimulating economic growth and employment. This is the tack taken by most industrialized nations in the present period; the one that produces the fewest jobs per capita outlay and the one that accelerates commoditization the most.

It may be possible to institute a "green" economic or industrial policy without explicitly addressing commoditization. Most of the current green taxes and subsidies are focused in industrializing appropriate technology. Denmark is one of the leaders in this area. Fuel taxes have been used to subsidize a growing wind power industry to the point where the Danes now produce 80% of the world's wind turbines and export 90% of those they build.²⁵ This model, the development and production of renewable energy and other clean technology equipment and supplies and the subsequent export of these goods to a world set on a clean energy path, is the commoditized version of sustainable development. It is necessary if the transition to a more energy- and materials-efficient economy is going to occur, but it is not sufficient to alter the economic system dynamics driven by commoditization that underlies the environmental crisis to begin with. All attempts to create a green economy or a green industrial revolution, although extremely important, will find themselves faltering without an accompanying decommoditization strategy intended to modify the system dynamics.

8.7 Credit policies

Credit is, in effect, borrowing from the future. This makes a lot of sense in the case of large purchases, such as a home, when the benefits are spread out over a long time into the future, in the case of building infrastructure that lasts, and in the case of capital investments that are expected to produce income in the future needed to pay off the debt. Credit does not make sense as a means to support current consumption except under special conditions of necessity. Under the strains of commoditization, when almost all human satisfactions are gained through purchase, borrowing for present consumption grows increasingly popular and the economy becomes dependent on the stimulus provided by easy credit. But debt obligations limit the choices individuals and societies have in making decisions on how to allocate their resources in the future. This constrains future opportunities and locks society into a pattern of never-ending economic growth. But as we have seen, as long as economic growth means the increasing mobilization of energy and materials, then ecological constraints will eventually make growth undesirable if not impossible and future debts unpayable. This is a formula for economic collapse and all its attending misery.

The difficult transition to an environmentally sustainable economy will require changing the patterns of production and consumption and, prior to disaster, shifting investments toward those goods and services that provide the greatest satisfaction for the least expenditure of energy and materials. But as we have seen, these tend to be the locally produced goods, culturally and ecologically appropriate tools, and the services of mutual aid and community building, all of which have some but not large amounts of commodity potential. The transition to a sustainable economy, therefore, will require considerable new investments in things that will not produce large profits on investment. Economic growth cannot be the goal of economic policy. Economic policy will need to be directed toward goals and objectives determined by the vision of a sustainable society. This will require unprecedented levels of intervention in economic decision-making, starting with the allocation of credit toward specific, socially beneficial ends at very low or no interest. Society will need to gain more control over the availability and price of credit. As we move toward a society built on smaller units of local communities and neighborhoods of mutual aid and relationships of caring with each other and the Earth, we will need large numbers of local, small creditors accountable to the local community and neighborhood. This is, of course, the vision of the early credit union movement.²⁶

Government policy in most modern societies affects the availability and price (interest rates) of credit through its taxing, spending policies, and its control over the money supply. These and other tools will need to be directed toward the goals of a sustainable economy if we are to have any chance of success. The difficulties will be enormous and the challenge great.

8.8 Building a movement

Statistics about how we presently spend our resources are often shocking. The World Watch Institute, a Washington, D.C., sustainable development research organization that tracks environmental trends, publishes a section in its *World Watch* magazine called "Matters of Scale." A recent issue (January/February 1999) gave readers the series of juxtaposed figures shown in Table 8.1, drawn from the United Nations *Human Development Report*.²⁷ These and similar statistics are often cited to demonstrate the greedy and selfish nature of human beings and the perversity of our priorities, but a closer look shows something else quite clearly. **Without deliberate intervention, the flow of resources concentrates in the economy of commodities and abandons the economy of caring and connection.** **Perfumes are a perfect and simple article in the economy of commodities, the provision of health care is a complicated system in the economy of caring.** The same contrast is true for sanitation vs. cosmetics and pet foods vs. the provision of health and nutrition. Military expenditures largely go to weapons and the soldiers who use them. **It is much simpler (and more amenable to commoditization) to destroy things than to build them.** **Education is one of the least commoditizable goods in the economy of caring and connection.** Finally, as we have seen, **commoditization leads to increasing concentration of wealth and power in fewer and fewer hands and the increasing marginalization of the poor. It is only possible to**

Table 8.1 Comparative Spending

Amount of money spent annually on perfumes in Europe and the U.S.	\$12 billion
Amount of money needed each year (in addition to current expenditures) to provide reproductive health care for all women in developing countries	\$12 billion
Amount of money spent annually on cosmetics in the U.S.	\$8 billion
Amount of money needed each year (in addition to current expenditures) to provide water and sanitation for all people in developing nations	\$9 billion
Amount of money spent each year for pet food in the U.S. and Europe	\$17 billion
Amount of money needed each year (in addition to current expenditures) to provide basic health and nutrition needs universally in the developing world	\$13 billion
Amount of money spent each year on militaries worldwide	\$780 billion
Amount of money needed each year (in addition to current expenditures) to provide basic education for all people in the developing world	\$6 billion
Combined income of the world's poorest 2.5 billion people	\$1 trillion
Combined wealth of the world's richest 225 people	\$1 trillion

Source: Worldwatch Institute, *World Watch*, June/July 1998. With permission.

change this situation, and to reverse the assault on global ecological integrity, through a collective decision to provide a balance between the economy of commodities and the economy of caring and connection.

Outrage over the results of commoditization and the desire for change is a natural reaction to the blatant misallocation of resources in the world. Many people respond personally by changing and simplifying their own consumption patterns, voluntarily serving others, and spending their lives in the economy of caring and connection by working in education, alternative health care, organic farms, etc. As important as all these responses are, they will always be marginal without fundamental change in the structure of the economy that privileges commodities over common and public goods and services. **The public sector must grow in relation to the private sector, and the economy must be treated as a subsystem of the world's natural and social systems.**

If an economy of commodities is allowed to serve its own ends, then commoditization and its attendant consequences are inevitable. **The economy must be made more responsive to the desire of human beings for a good life in sound, sustainable communities on an Earth that is ecologically vibrant and healthy.** **These changes will require a major new political movement to assert the values of caring and connection distinct from the values of commerce.**

What our analysis uncovers is the deep connection between seemingly disconnected issues as pollution, oppression of women, appropriate technology, the rights of indigenous people, working class oppression, grassroots democracy, public transportation, the low pay of service workers, the isolation of the disabled, globalization, and many others. Although several efforts have been made to bring people concerned about these disparate matters together into a progressive majority, a common political agenda and strategy has not been clear. With the decommodification strategy outlined in this chapter, we begin to see our way out of the trap of commoditization and into new forms of governance and popular democracy. **The opportunities for coalition building and real political and economic change are exciting.**

They begin with the recognition that an equitable and sustainable society is a clear and desirable possibility for which it is worth working and organizing. There is by now considerable evidence that dramatic improvements in energy and materials efficiencies are practical and possible. There are large differences between advanced economies in terms of the amount of energy used per capita GNP: the average person in the U.S. uses 2.3 times as much fuel as the average European, and no one claims that the quality of life in the U.S. is more than twice as high as in Europe.

Progress in energy efficiency has been made largely through technological change and only relatively minor policy incentives. With real commitment to invest in the new industrial revolution, these gains can be accelerated. **The commodity economy can readily be made more efficient and earth-friendly.** **With the right policy signals and reforms that encourage conservation, the transition to efficient economy will take off.**

The major oil companies, the energy, automobile, and a few other industries will resist the change, but resistance can be overcome through an alliance of environmentalists, consumers, and the majority of industrial groups. These groups will understand what Amory Lovins claims, that global warming and other environmental problems are not threats to business; rather, they are huge opportunities to benefit from a major new wave of investment in plants, equipment, appliances, and the other parts of the commodity economy that will be retrofitted or replaced.²⁸ The efficiency revolution will mean new jobs. Every dollar spent on efficiency produces more jobs than a dollar spent on energy production. The first and simplest demand, therefore, is for a global political commitment, following the global warming treaty, to accelerate the existing trends toward energy conservation and efficiency. Public concern about global warming and its effects, along with the spread of information and examples of how to design and produce for super efficiency, will provide the catalyst for change.

The benefit of promoting this vision of a new industrial revolution or an efficiency revolution is that it is a hopeful picture of the future that can be juxtaposed against the sense of foreboding with which many people are looking into the future. It is doable and politically feasible given the natural conjunction of business, consumer, and environmental interests. It is the first step in a decommodification strategy, because it can be popular and at the same time require increased government involvement in markets through public infrastructure investments, tax and subsidy policies, and regulations so that prices reflect the environmental and social costs of products. It will unleash a tremendous amount of creativity and enthusiasm from designers, scientists, and tinkers of all kinds. The employment benefits will bring portions of the labor movement who will benefit and create a political demand for a just and fair transition for the workers in the old industries where jobs will be lost. This creates the need to assist workers and communities presently dependent on old, energy-inefficient industries to more smoothly make the transition to the new jobs and opportunities.

Reform of the commodity economy will be the first successful battle in the movement for sustainable development, and it will greatly enhance the possibilities of success in later struggles, but it will not succeed by itself, because it will not likely take on the job of providing ongoing economic counterbalances to the pressures of commoditization. There are many flaws in the argument for the new industrial revolution, not the least being that retrofitting of the present economy at the scale that will bring about 50% or 90% improvements in energy efficiency will require massive new construction and new production, all of which will use primary materials that require energy to obtain and produce. Energy efficiency estimates will need to include the amount of energy needed for this transition. Furthermore, if the economic savings produced by increased efficiencies are allocated to consumers in a highly commoditized economy, they will likely spend those savings on more commodities. The portion of the savings retained as profits are likely to go into new investments to produce more goods and services. The net result will

be continued and perhaps accelerated economic growth. If carried out globally the end result of even a tenfold increase in energy efficiency will lead to massive worldwide increase in energy and materials use.

A strategy of deliberate decommodification, replacing material and energy with knowledge, mutual aid, and community, must therefore accompany any strategy of efficiency if the result is not going to be just increased consumption of energy and materials. Yes, the commoditized economy must be made more efficient and yes, it will be exciting and rewarding to accomplish this task. But the commoditized economy must also be made smaller, and global development policy must turn away from the goal of growing the commoditized economy toward a new goal, improvements in quality of life with less energy and materials. With a decommodification strategy to accompany an energy efficiency policy, the money saved would be allocated toward community building, health maintenance and disease prevention, hands-on care for people in need, agricultural skills-building, land conservation, liberal education, and the whole array of public goods presently marginalized by commoditization. A portion of the savings of the efficiency and information revolutions must be effectively captured to serve the public interest. The only way for that to occur is for the public to gain or regain control over the institutions of governance and for those institutions to have the capacity to obtain and direct resources toward public goods with little or no commodity potential.

Developing the political will to decommoditize will be more difficult than achieving substantial energy efficiency gains, because decommodification will have no obvious business allies. But it will also be a more popular challenge, because it will cut across many different social movements that have not previously clearly understood the connection between their goals and decommodification. A decommodification strategy will mean having to sever the close alliance between business and government that has created the policies of commoditization. It will require removing money from politics as much as possible. This creates the first of many possible political alliances between disparate social movements, environmentalists, and the advocates for good, responsive, publicly accountable government. Seeing that the vast majority of the world's population favors good government and a healthy environment, the popular base clearly exists for a social and political movement in support of the economy of care and connection.

According to Michael Walzer in his influential book *Spheres of Justice* (1983), the very meaning of tyranny is when those who succeed in one sphere of social life (such as money and commodities) deliberately and unjustly wield the power and influence gained there to dominate in another sphere of social life (such as political influence). The current role of some multinational corporations has been well documented.²⁹ Liberty, according to this formulation, requires active defense of the boundaries between the spheres. But commoditization, which also leads to domination by one sphere (money) over all others, is a "natural" outcome of system dynamics, and the methods of defending against it are not nearly so clear as those in

the struggle against a tyrant who can be named and constrained or removed from power. Nonetheless, the movement for liberation from oppression involves much the same institutional framework that Walzer prescribes for the defense of liberty:

a strong welfare state run, in part at least, by local and amateur public officials; a constrained market; an open and demystified civil service; independent public schools; the sharing of hard work and free time; the protection of religious and familial life; a system of public honoring and dishonoring free from all considerations of rank or class; workers' control of companies and factories; a politics of parties, movements, meetings and public debate.³⁰

Such an institutional framework would need to consider the way economies evolve through selection pressures and deliberately design public policy instruments that provide countervailing forces to the pressures of commoditization. In addition to reinvigorating presently impoverished spheres of communal life, this would have the additional benefit of reducing the amount of materials and energy needed per unit of social welfare.³¹

This movement gains moral clout from the general understanding that there are many things of value that can't be bought and sold, and that it is the responsibility of society and its public institutions to protect these values against the corrosive effects of money. This common wisdom is given explicit meaning in the work of ecological economists, who demonstrate that the Earth provides the ultimate raw materials in the air we breathe, the forests that clean the air, the water that sustains us, and the sunlight that powers all work. These goods have not and cannot be adequately priced or fairly represented in private markets. The political implications of this are clear: society and its institutions must allocate resources for the protection of that which cannot be readily privatized. We cannot assume that private individuals, protecting their private property, will adequately be able to protect public property and public goods. This simple logic has enormous political consequences, because it calls forth the need for a greater role for society and its institutions to intervene in private markets for the public good. Advocates for the rights of women note that a large percentage of the work traditionally carried out by women, the work essential to the economy of caring and connection, is not compensated by private markets. The overreliance on markets to allocate the wealth produced in the economy, therefore, is fundamentally unfair to women and a major reason for the inequality between the sexes. Ready to join the advocates for good government, environmental protection, and women's equality are the vast majority of the religions of the world who value exactly that which cannot be priced, who have a long and powerful tradition of speaking out about the corrupting influence of money in public life.

What is common to all these arguments about the need to properly value that which is not fairly priced in the free market is what could be called a politics of fair compensation. This is an idea around which much of the world can be mobilized. People understand notions of basic fairness and just rewards. In the popular understanding of justice there is an appreciation as well of the rightness of proper compensation for the victims and heirs of past wrongs. As we learn more and more of our history, we understand that the wealth of the North derived in large part from a long and tragic story of the exploitation of the labor, land, and resources of the South. If free markets left on their own continue this legacy of exploitation, then fairness and justice require that global civil society intervene through its institutions, and its global trade agreements, its United Nations, and its international financial institutions to correct the inequality and compensate those from whom much was taken and little returned. A politics of just compensation would insist that enough of the wealth produced in the world be directed toward sustainable development of the poor so that all can have access to the basics of food, sanitation, health care, and education.

The great tragedy of commoditization is the way that development has been distorted. It is not possible to recover all the lost development opportunities we have foregone these many years. Who knows the varieties of the crops Incan scientists could have produced, what brilliance of forestry the Iroquois could have managed given the time and resources. Our development path has been stunted and narrowed by the forces of commoditization, and we have paid dearly, some more than others, all of us to a great degree. But we can start now. The opportunities are immense if we begin to invest heavily in sustainable development.

All around the world people are inventing and rediscovering models of development capable of delivering a high level of satisfaction of basic needs without over-exploiting the environment. These models are based as much as possible on local community and neighborhood self-sufficiency, small scale and ecologically designed sanitation and water-delivery systems, small farms using a creative melding of modern technology and ancient ecological wisdom, appropriate and locally suited and modified technology and renewable energy. The price of spreading, supporting, and celebrating this model of development is small in dollar terms but enormously challenging politically. It will mean fundamental reforms, including land reform and democratization in favor of the poor. It will mean a sound strategy of decommunitization in the global economy, which in turn will require international institutions capable of raising and distributing sufficient amounts of capital to make a difference.

Just as the key to unleashing creative energies for commercial development lay in the invention and application of stimulative legal and political structures at the appropriate level of government, the key to unleashing noncommodity energies of caring and connection is also legal and political reform at the appropriate level. In the present economy this means having to regulate simultaneously at the global, national, and local levels.

Commercial law is now evolving into a global legal framework designed to unleash commercial energies worldwide by minimizing the capacity of states to restrict access to markets. As a result, commoditization pressures are expanding into all potential niches worldwide. Since the legal and political actors unleashing these forces operate at the global level, countervailing pressures must also operate globally. There must be legal and political reforms in the global trade and finance regimes. But since noncommodity solutions to human needs and wants are inherently local, the effects of these countervailing forces must be felt at the local level. New legal and political capacity to stimulate investment in community-based, less commoditized satisfactions for human needs and wants must evolve and go to the level nearest to the people with those needs and wants. There have been several efforts to describe the emergence of global civil society as a precursor to emerging governance capacity that can act with some affect and authority at both the global and local levels.³² At the same time, nations must invent new legal frameworks that allow localities to innovate economically and that protect them from the colonizing impulses of global forces and actors.

One of the most compelling hopes for the future is the new leadership in Third World development that is emerging throughout the world. These leaders understand the history of colonialism and its effects; they have an understanding of ecology as well as a deep connection with the cycles and potentials of their own land. They are grounded in the values of traditional cultures and open to creative and locally appropriate technological innovations. In every part of the world thousands of these leaders are emerging, putting together the pieces of a strategy for Third World sustainable development. What is emerging is the beginnings of a powerful global social movement. This movement is being simultaneously organized at the local, regional, and global levels. It is a movement for justice, local self-reliance and development, international equality, and peace. If successful it will create the social conditions for the emergence of a new set of political institutions capable of acting in the global economy for the common good. It will create a new global political order and a sound and fair balance between the economy of commodities, which produces the world's wealth, and the economy of caring and connection, which supports the world's well being. The institutions of governance that will emerge will coexist at the local, bioregional, regional, and global levels, with problems handled at the lowest possible level, moving up in the structure only as the consequences — such as global warming, global capital movements, and global civil compacts — rise.

In the early part of the next century this movement will flourish in exciting and powerful ways. The leadership will come from people of the former colonial world, the indigenous people, women, particularly women of color, the small farmers, and traditional peoples. Their struggles to gain the political capacity to challenge entrenched systems of wealth and power will inspire millions of people, especially the young, in the wealthy enclaves of the world. Like youth movements of the past, these will gain alliances among the older generations, particularly the "baby boomers" of North

America as they head toward the later parts of their lives and begin again to focus on the things of this world that truly matter.³³ This will be an exciting time. The music, art, and celebrations of the Third World will be adopted and adapted by youth everywhere, as it already is in the popular music of the young. As the movement for sustainable development and justice grows in different parts of the world, their struggles and successes will inspire each other. The picture of determined people taking charge of their own destiny will be beamed throughout the world via TV and the Internet. Instantaneous communication will make it difficult for these movements to be suppressed, and their leaders disappeared.

The objectives of this movement will be the protection of the health and integrity of the Earth's ecosystems, its diverse forms of life, and the elimination from the Earth of human exploitation, poverty, and misery — the two dreams that have been linked now irreversibly in the concept of sustainable development. As we have seen, development cannot be made sustainable without countering the pressures of commoditization. Sharing and improving an understanding of commoditization and its effects on society and the environment has been my goal in writing this book. My hope is that by understanding how commoditization works and how different policies and institutions can be designed to counterbalance it, the movement for caring and connection can be better situated to act strategically and effectively.

In the end we must each find proper balance in our own lives between our global dreams and our local connections. We can each direct our personal time, attention, and resources to make certain our individual and local community economy of caring and connection prospers. Where the institutions of governance fail us, we must join with others to reclaim them, reform them, and make them the tools by which we act for the common good. The laws of nature that determine the structure and design of our world are laws we cannot avoid. We can learn from them and learn how to live well within them, but we ignore them at our peril. The laws that determine the structure of our economy, on the other hand, are partly those of nature and partly of human design. What humans design we can change purposely and intelligently using the best information we have. The information we now have is that our economy privileges commodities over all else and thereby distorts our way of life so that the things that really matter — our connection and caring for each other and the Earth — are forgotten and ignored. We have the capacity to change this by making the economy accountable to governance, and governance accountable to citizens.

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